DOCUMENT RESUME

ED 156 432 SE 024 300

AUTHOR	Lachat, Mary Ann; And Others
TITLE	Math Programs That Work: A National Survey. Third Edition.
INSTITUTION	Capla Associates, Inc., Rochelle Park, N.J.
SPONS AGENCY	New Jersey State Dept. of Education, Trenton. Div. of Research, Planning, and Evaluation.
PUB DATE	77
NOTE	102p.; For first and second editions, see ED 095 016 and ED 111 650; Color-coded charts and photographs may not reproduce well
EDRS PRICE	MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS	Adult Basic Education; Catalogs; *Diagnostic Teaching; *Directories; Early Childhood Education; *Educational Programs; Elementary Secondary Education; Mathematics Education; *Program Descriptions; Reference Materials

ABSTRACT

This directory reviews 26 diagnostic-prescriptive mathematics programs. Twelve of the programs are complete mathematics programs; the remaining fourteen are supplementary programs. The programs are designed for use in one or a combination of grade levels from pre-kindergarten through grade twelve in addition to one program designed for adults. Each program is outlined according to: (1) nature, purposes, and rationale of program; (2) organization of program; (3) material provided for student, teacher, and classroom activities; (4) implementation requirements and provisions including cost of program; (5) the present status of the program; (6) how the program was evaluated along with strengths and weaknesses; and (7) where the program can be obtained. In addition, a Program Profile Matrix includes salient features of the individual programs and can be matched to descriptors of current program needs. (MN)

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ED156432

Math Programs That Work
A National Survey

Third Edition
1977

Mary Ann Lachat, Ed.D.
Ronald L. Capasso, Ed.D.
Ingrid S. Bartinique, Ed.M.

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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Robert Francis

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

This series was produced under the auspices of: Educational Improvement Center—South. Lower Camden Board of Education.

Prepared by Capla Associates, Inc.
Under a grant from
The New Jersey State Department of Education
Division of Research, Planning, and Evaluation

SE 024 300

INTRODUCTION

America's schools are entrusted with the task of preparing millions of students annually to cope with a post-industrial, post-affluent society which demands a high order of knowledge and skills. The task is not an easy one, and the products of past efforts have often been unmastered skills and poorly developed problem-solving abilities. More than ever before, the quality of education is being questioned, and schools are being prodded to offer programs which address divergent backgrounds, interests, and abilities.

The complexity of our task as educators demands more systematic procedures for renewing past policies and practices. We, in New Jersey, have responded to this complexity through the passage of "thorough and efficient" legislation.

In essence, "T and E" calls for the use of productive educational programs, methods, and materials which will enable students to achieve at their highest potential. We recognize, however, that efforts to improve instructional systems are as old as the process of education itself. Effective change strategies require specific information about the characteristics of various programs and how they affect student learning. In short, the establishment of more systematic means for disseminating and installing proven educational practices offers the greatest single potential for renewal in New Jersey schools.

Reading Programs That Work and *Math Programs That Work* represent a response to the need for an information base that will enable school districts in New Jersey to make responsible and meaningful decisions about basic skills instructional programs. As with the earlier editions of these publications, the programs were identified through a comprehensive nationwide search. They were located through such sources as the Joint Dissemination Review Panel of the U.S. Office of Education, the American Institute of Research, Far West Regional Laboratories, the International Reading Association, Research for Better Schools, and over forty commercial publishers. In the final analysis, over 300 programs were considered for inclusion. The final decision as to which programs would appear in the publications was based on available evaluation data that indicated that the programs had demonstrated a positive impact in the classroom.

I urge you to use these documents. They represent a first step in the process of providing New Jersey youth with instructional programs that will make a difference in how they ultimately function in society—a difference that will help us, as educators, achieve our entrusted goal.

Dr. Fred B. Burke
Commissioner of Education
State of New Jersey

ACKNOWLEDGEMENTS

The publication of the third editions of *Reading Programs that Work* and *Math Programs that Work* required the time and effort of a large group of people. It would be impossible to list the names of all of the individuals who contributed to the completion of these documents as well as the detailed pamphlet descriptions for 90 exemplary basic skills programs. However, several individuals were particularly integral to the various levels of activities involved in the project.

The project would not have been a reality without the commitment of the New Jersey State Department of Education to help school districts bring about meaningful and systematic change. The insights of Dr. Evelyn Ogden, State Director of Planning, Division of School Programs, and Ms. Jean Sadenwater, Coordinator of Process Consultants at Educational Improvement Center-Central were invaluable to the development of the program information system which will now be available to New Jersey teachers and administrators.

The reactions and suggestions of an Advisory Panel provided valuable guidelines for improving the earlier publications and meeting the current needs of New Jersey educators. The individuals who served on the panel made contributions which reflected their varying roles in the field of education. These individuals were:

Mr. Steve Barkley	- Primary Unit Teacher Hampton Township School District
Dr. Estelle Brown	- Professor, Department of Reading and Speech Correction Glassboro State College
Ms. Wilma Farmer	- Elementary Supervisor Camden School District
Ms. Sharon Gelbman	- Intermediate Team Leader Chatham Borough School District
Ms. Betty Guatelli	- Learning Activities Coordinator and "T & E" Coordinator Ramsey School District
Ms. Alma Liotti	- President Elect, New Jersey Reading Teachers Association and Right to Read Consultant
Ms. Elena Scambio	- Supervisor of Child Study Essex County Office of Education
Ms. Geri Tama	- Learning Consultant, Office of Special Services Greater Egg Harbor Regional High School District

Our appreciation is of course extended to the developers and publishers of non-commercial and commercial programs who submitted materials for review. Finally, a note of thanks must be extended to such members of the Capla staff as Ms. Jackie Akers, Ms. Sandra Bockman, Ms. Barbara Ortutay, Ms. Wendy Spence, and Mr. Richard Strugala, for their contributions in bringing the third editions of the basic skills publications to fruition.

Marv Ann Lachat, Ed.D
Ronald L. Capasso, Ed.D
Ingrid S. Bartinique, Ed.M

Capla Associates, Inc.
Rochelle Park, New Jersey

HOW TO USE THIS CATALOGUE

AS PART OF A PROGRAM SELECTION PROCESS

This catalogue represents a valuable resource for districts involved in the program improvement phase of "T & E" which is concerned with identifying and selecting new programs. The following questions are provided as illustrations of how to use this catalogue and supplementary sources of information to guide the program selection process.

How should this catalogue be used to identify programs which address basic skills instructional needs?
If you have identified a need for program change in your district, turn to the Program Profile Matrix which is found on pages 6 - 9. The matrix includes salient features of the individual programs included in this catalogue which can be matched to descriptors of your current program needs. After reviewing the Program Profile Matrix, turn to the Table of Contents to locate pertinent program descriptions in the catalogue.

What information is necessary for making initial program selections?
The initial selection of programs for potential adoption/adaption requires information about how a program works and what is required for implementation. Reading the program descriptions in the catalogue will provide you with this information, and help you decide whether a program relates to needs for improving basic skills instruction in your district.

What additional information is necessary for the next level of decisions in the program selection process?
The selection or rejection of instructional programs requires specific criteria that will enable teachers and administrators to make informed decisions. The criteria used to assess programs should relate to: 1) the program's rationale; 2) the objectives of the program; 3) how the program is organized; 4) what is required of the school district to implement the program; and 5) what evaluation results are available which prove the program's effectiveness in helping children to learn. This type of detailed information is available in a pamphlet format for every program in this catalogue.

How can school districts obtain detailed program pamphlets?
The detailed pamphlet descriptions for every program in this catalogue are available at no cost from the regional Educational Improvement Centers of the New Jersey State Department of Education. The pamphlet order number for specific programs can be found in the Table of Contents or at the end of each catalogue description. Mail the order form postcard which is included in this catalogue to the Educational Improvement Center in your region to obtain pamphlet descriptions of programs which may address your needs. The addresses of the various Centers are given below.

Educational Improvement Center-Central
50 Lake Drive
Hightstown, New Jersey 08520
(609) 448-0484

Educational Improvement Center-Northeast
86 South Harrison Street
East Orange, New Jersey 07018
(201) 677-9600

Educational Improvement Center-Northwest
Halko Drive
Cedar Knolls, New Jersey 07927
(201) 539-0331

Educational Improvement Center-South
P.O. Box 426
Pitman, New Jersey 08071
(609) 589-3410

What are the next steps in the program selection process?
Actual program materials should be examined before final decisions about selecting a program for adoption/adaption are made. The catalogue and pamphlet descriptions provide information about where program materials can be obtained. Materials should be secured and reviewed by staff as additional evidence before making a final program selection.

It is the hope of the New Jersey State Department of Education that this catalogue and the related pamphlets will help you identify exemplary basic skills programs for your district. The use of these resources will also reduce your time and cost expenditures in the program selection process.

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COMPLETE PROGRAMS

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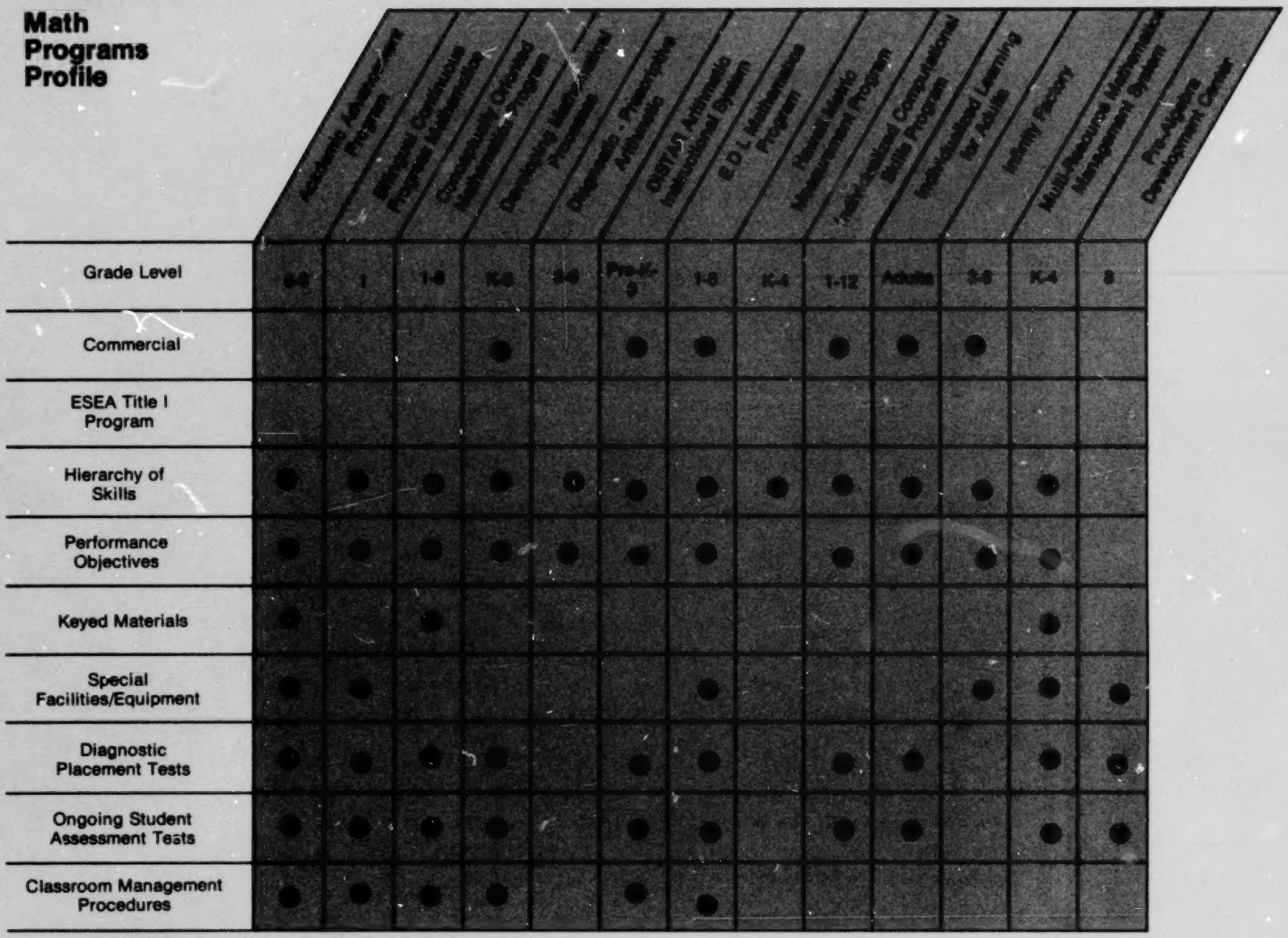
*A complete pamphlet description of every program in this Survey may be ordered by code number from the regional Educational Improvement Centers of the New Jersey State Department of Education.

Math Programs Profile



= Complete Program

= Supplementary or Support Program

Math Programs Profile

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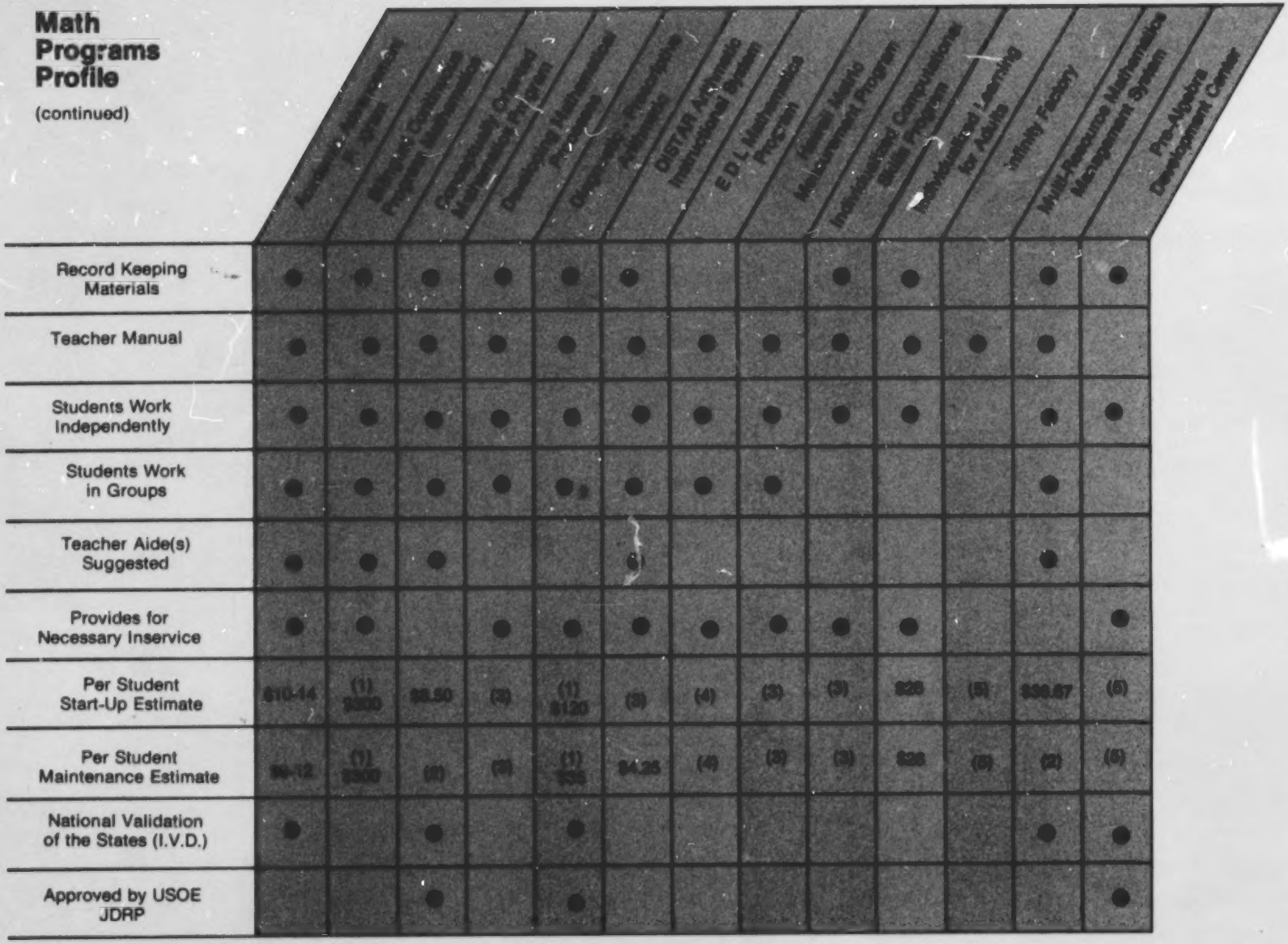
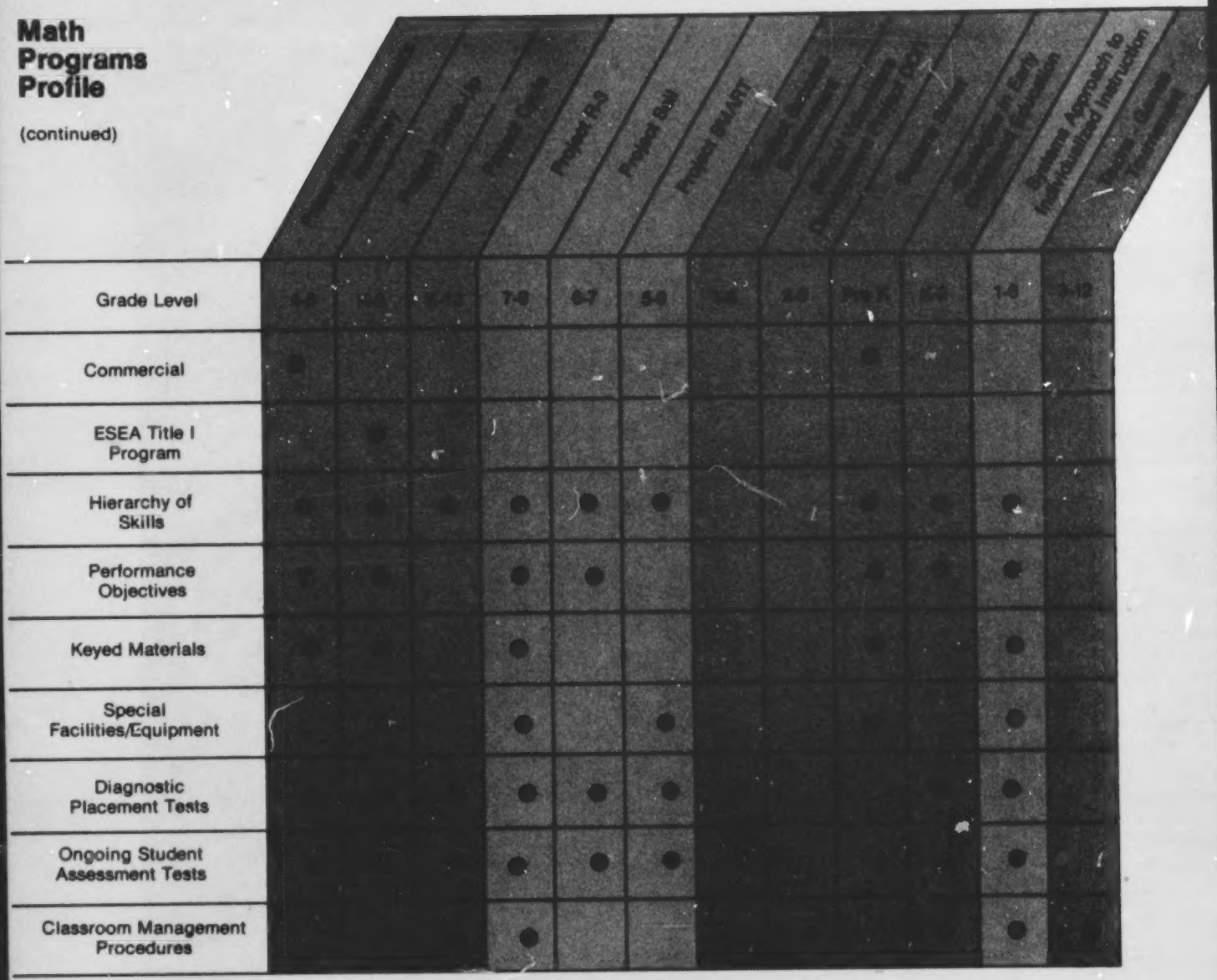


(1) Per Classroom Estimate
(2) Minimal Maintenance Costs
(3) Varies for Different Levels
(4) Multi-Media Lab—$3,000-7,000 Start-Up, and $300-400 per Lab for Maintenance
(5) Varies with Existing Resources

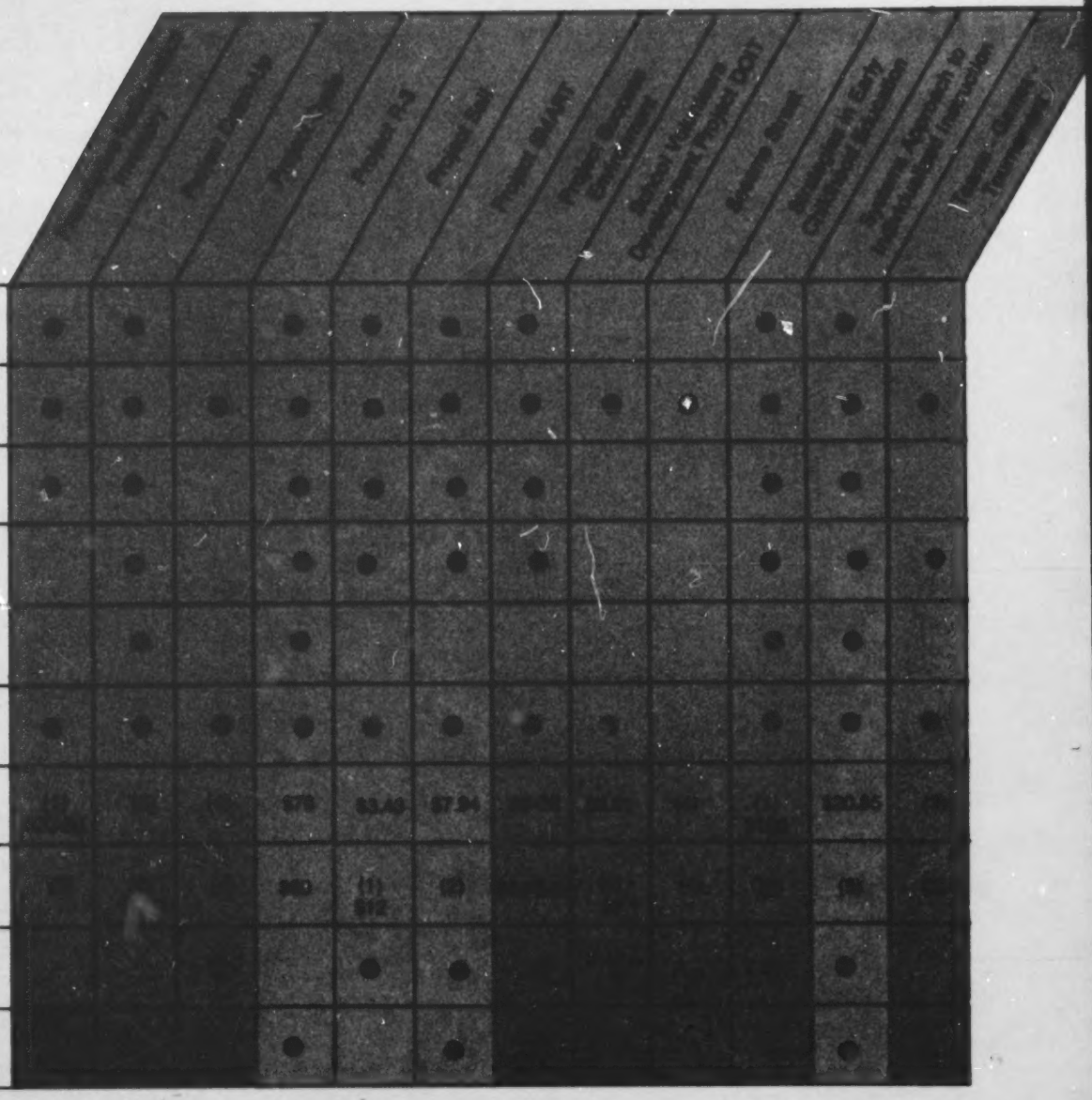
Math Programs Profile

(continued)



Math Programs Profile

(continued)

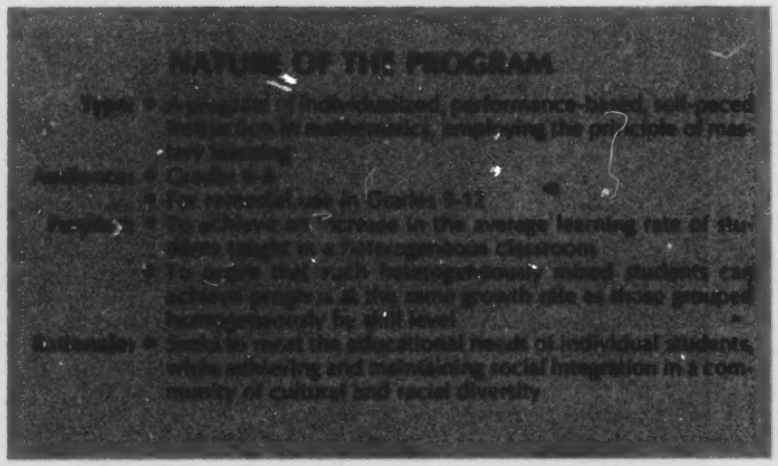


Record Keeping Materials	●	●		●	●	●	●			●	●	
Teacher Manual	●	●	●	●	●	●	●	●	●	●	●	●
Students Work Independently	●	●		●	●	●	●			●	●	
Students Work in Groups		●		●	●	●	●		2	●	●	●
Teacher Aide(s) Suggested		●		●						●	●	
Provides for Necessary Inservice	●	●	●	●	●	●	●	●		●	●	●
Per Student Start-Up Estimate				$78	$3.45	$7.24					$20.85	
Per Student Maintenance Estimate				$40	(1) $12	(2)					(6)	
National Validation of the States (I.V.D.)					●	●					●	
Approved by USOE JDRP				●		●					●	

(1) Per Classroom Estimate
(2) Minimal Maintenance Costs
(3) Varies for Different Levels
(4) Varies with Existing Resources
(5) Multi-Media Lab—$6,500
(6) Includes Staff Salary

ACADEMIC ADVANCEMENT PROGRAM (AAP)

Morristown, New Jersey



WHAT HAS THE PROGRAM ACHIEVED?

The program objective—to show no difference in mathematics or language arts growth between experimental and control groups as a result of changes in teaching format—was achieved. Experimental students, in fact, generally made higher gains than control students exposed to traditional homogeneous grouping. The data suggested that heterogeneous instruction is a viable alternative to a traditional homogeneous approach in a public school setting.

HOW DOES THE PROGRAM WORK?

Organization: The program is organized into 66 hierarchical units. These units provide learning mastery of a mathematical skill sequence which ranges in difficulty from operations with whole numbers, to those involving roots, radicals, and quadratic equations. Four commercially produced mathematics programs

have been integrated to give a variety of options for the learning experience. Pre- and posttests accompanying the units provide the teacher with specific information on students' needs and progress.

Materials and activities: The commercial programs required for AAP replication are:

INDIVIDUALIZING MATHEMATICS (Addison-Wesley)
ESSENTIALS OF MATHEMATICS (Ginn & Co.)
ALGEBRA: A MODERN INTRODUCTION (Addison-Wesley)
SPECTRUM MATHEMATICS (Laidlaw Bros.)

Materials provided by AAP include:

1. A teacher's manual for all materials
2. Correction key
3. A progress record card for each student
4. Pre- and posttests
5. Student/parent questionnaires
6. Individual instructional units
7. Homework packages

Students work in large groups, in small groups, and individually, spending from 40-60 minutes per day in AAP class, depending upon their grade level and need. Approximately 75 minutes per week of homework is also expected. The teacher acts as a facilitator of self-paced instruction, rather than as a lecturer. Assistance in classroom management (grading papers, record-keeping, etc.) is provided by one or more teacher aides.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: AAP offers orientation presentations, visitation opportunities, dissemination materials, and training services to interested educators. The demonstrator site provides four-day training workshops free of charge to those districts agreeing to replicate the essential elements of the original program. It is requested that the replicating district send at least one administrator to the training workshop, in addition to the teachers. Formal training of aides is not required.

Cost: The implementation cost is approximately $10-14 per student, depending upon grade level. Maintenance costs for later program years are approximately 10% less. The installation cost of storage facilities for the learning materials (a necessary aspect of classroom management) is no more than $200.

CURRENT STATUS AND CONTACTS

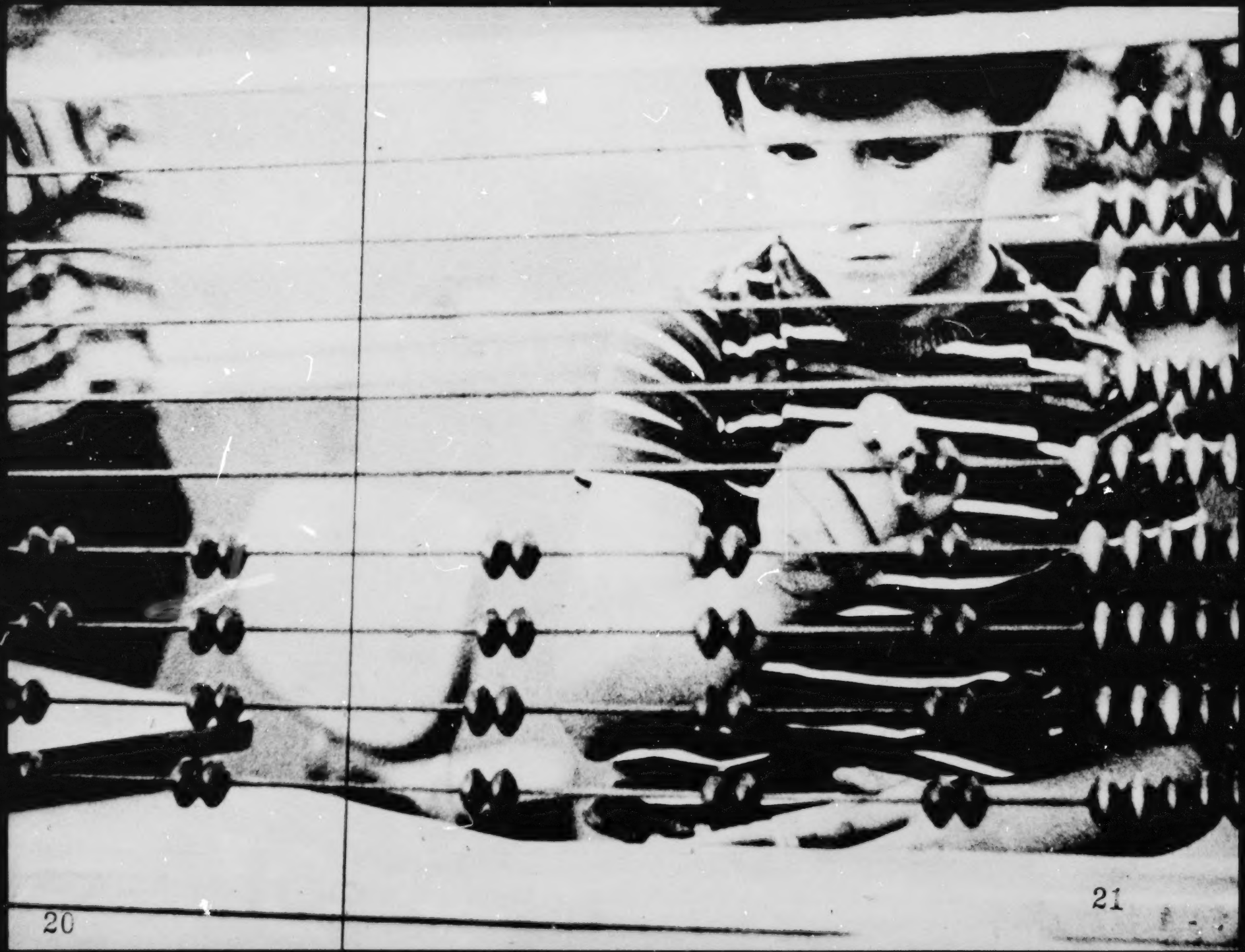
AAP is a nationally validated dissemination/demonstration project under ESEA Title III-IV (C).

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

Send for Pamphlet No. **M1.**

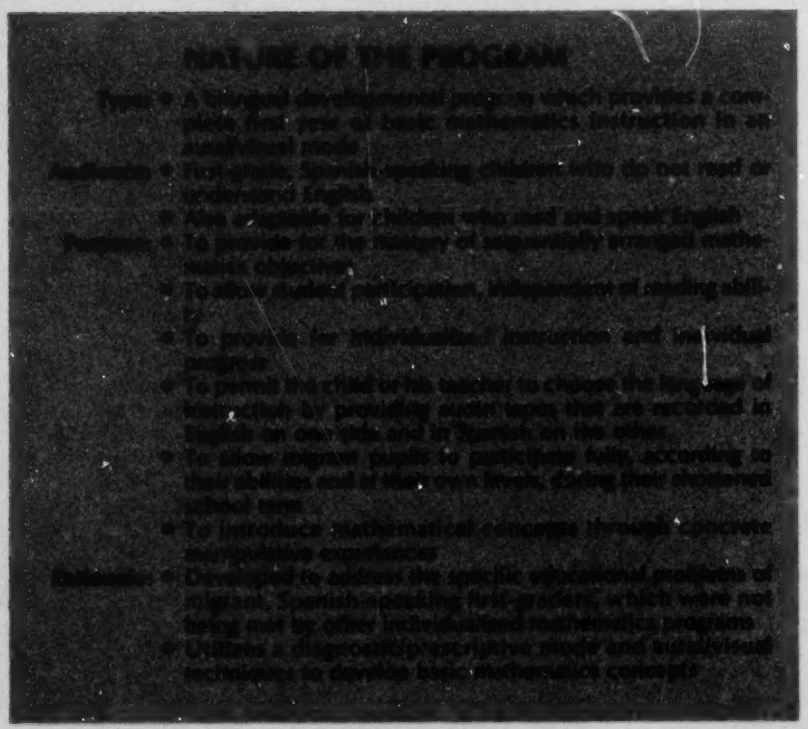
Additional information may be obtained from:

Joseph H. Dempsey
Academic Advancement Program
40 Mills Street
Morristown, New Jersey 07960
(201) 539-6100



BILINGUAL CONTINUOUS PROGRESS MATHEMATICS

Austin, Texas



WHAT HAS THE PROGRAM ACHIEVED?

Analysis of pre-posttest performance of the project group on the Primary Mathematics Test, a publication of ETS, showed statistically significant gains for pupils in the program. Results from an analysis of covariance, comparing the same BCPM pupils with a comparable control group, indicated that the project group made significantly greater gains on the test than the control group. Also, students in the program had little difficulty moving into traditional second grade mathematics programs.

HOW DOES THE PROGRAM WORK?

Organization: The program is designed to allow a child to begin mathematics instruction at whatever time of year he enters first grade and, thereafter, to proceed at his own pace. BCPM uses an aural/visual mode, based on 93 objectives arranged into mathematical areas at two levels of difficulty. Children are assigned to work with the kind of instruction and with materials that will be of most help to them individually. They may work in small groups, independently, with a peer tutor, or with the teacher or aide. The amount of time each student spends in the program depends upon individual needs. Skill checks at the end of each work booklet measure the student's progress.

Materials and Activities: The children use prerecorded cassette tapes and workbooks. A manipulative activity introduces each concept. Then each objective is presented in a workbook, with instructions for the child given in either Spanish or English on an accompanying cassette tape. In addition to the cassettes and workbooks, the program includes a teacher's manual which contains suggestions for classroom management, a glossary of Bilingual Continuous Progress Mathematics terminology, and a Prescription Chart which sequentially lists the minimal assignments for each lesson. Also provided are diagnostic and mastery tests, as well as individual Assignment Charts and Achievement Profile Sheets.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: Staff development is built into the program through the teacher's manual which provides comprehensive suggestions about the organization and management of the program and the use of program materials. In addition, the Southwest Educational Development Laboratory will assist in staff development, and staff and program evaluation.

Cost: The cost for installing the program is approximately $500 for setting up a math center, plus $300 per classroom of 30 children for consumables (workbooklets). The math center can be shared by several participating classes.

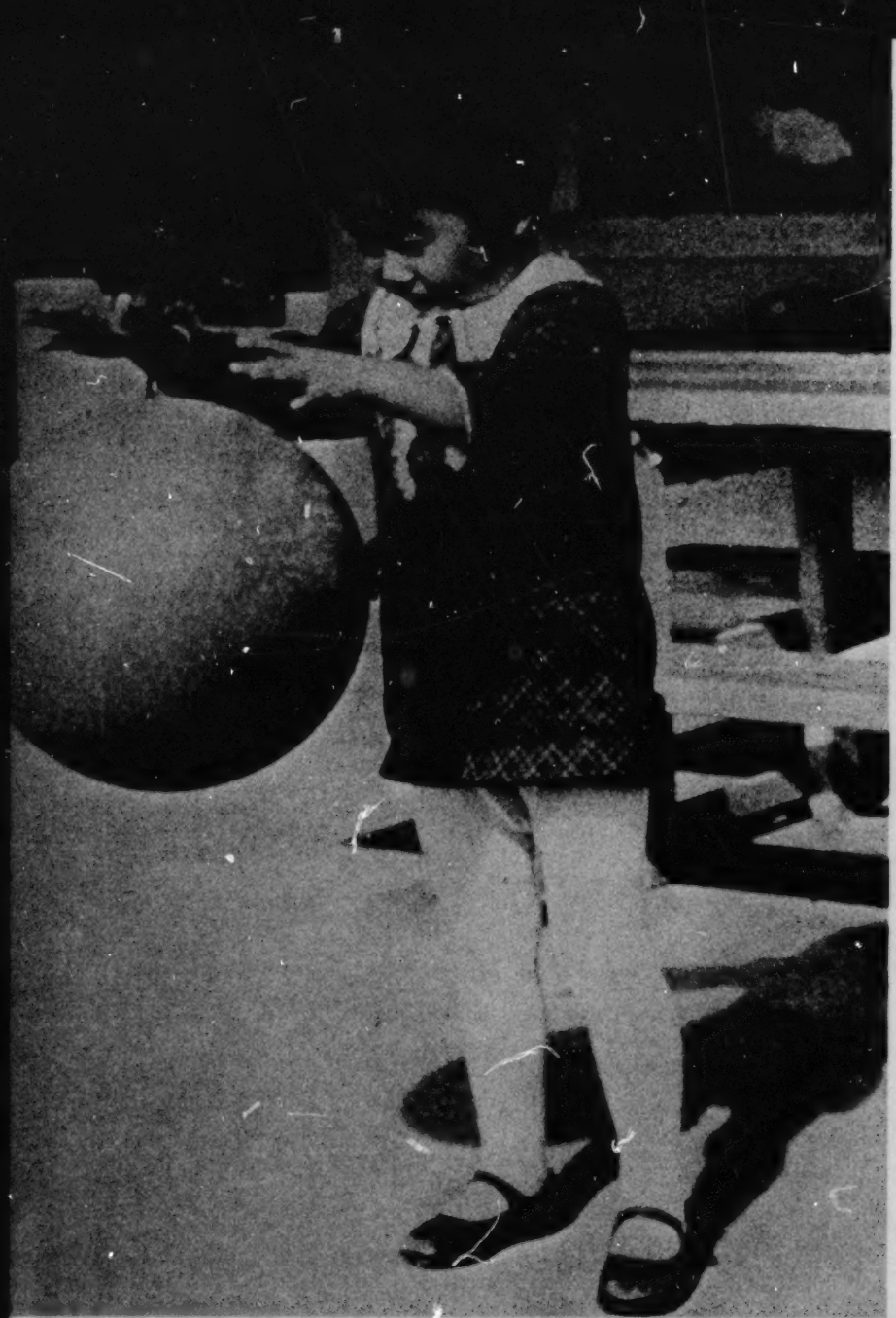
CURRENT STATUS AND CONTACTS

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

Send for Pamphlet No. **M2.**

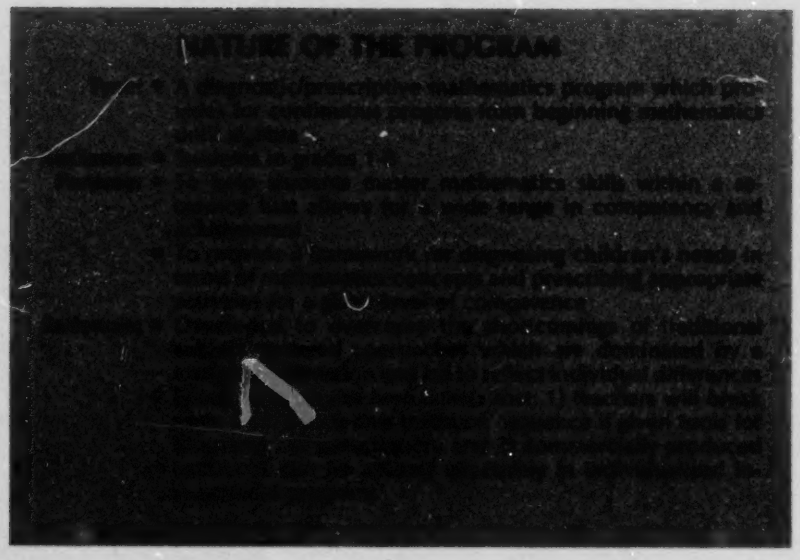
Additional information may be obtained from:

Director, Field Relations and Dissemination
Southwest Educational Development Laboratory
211 East 7th Street
Austin, Texas 78701



CONCEPTUALLY ORIENTED MATHEMATICS PROGRAM

Columbia Public Schools
Columbia, Missouri



WHAT HAS THE PROGRAM ACHIEVED?

Evaluation of the Columbia, Missouri, program in grades 2-8 showed that the mean increase on the **Iowa Test of Basic Skills** after one year in the program was 10.5 percentile points, with 77% of the participating students showing an increase of 16.5 percentile points and 20% of the population a mean decrease of 10.5 percentile points. In two New Jersey school districts, the first year of COMP implementation revealed no significant differences in math achievement, from pre-to-post test, between pilot and control groups on the **Iowa Test of Basic**

Skills and the **Metropolitan Achievement Test.** However, teachers felt that the program had a positive impact on their instructional approaches, and expressed satisfaction with COMP's emphasis on concepts, its range of materials, and the skill level groupings.

HOW DOES THE PROGRAM WORK?

Organization: Student skills are developed in ten broad concept areas, and progress is determined by the student's own competence and achievement. The teacher acts as a manager of learning and is able to work with students on an individual basis. The concept areas include Numerals, Order, Addition, Subtraction, Multiplication, Division, Function, Graphs, Geometry, and Measurement. Lower grade students use the program about forty minutes a day, and students in the upper grades average about sixty minutes per day. Placement tests determine the point at which the student enters the instructional sequence, and posttests are given at the end of each level. Teacher aides facilitate record-keeping.

Materials and Activities: Materials indigenous to COMP are Scope and Sequence Charts, the Teacher Guide Book, placement and posttests, and individual mathematics profiles. COMP is cross-referenced to commercial textbooks published by D.C. Health, Houghton-Mifflin, Scott Foresman, and Addison-Wesley. The program also suggests the use of filmstrips and tapes. As the student progresses through a level, the teacher offers guidance and uses innovative teaching aids which are suggested in the Teacher Guide Book.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: There are no special provisions for staff training; however, the Teacher's Guide Book serves as a handbook for implementing the program. An inservice program on diagnostic/prescriptive techniques and classroom management procedures is viewed as being helpful.

Cost: According to the E.S.E.A. Title III national validation report, the estimated cost to implement this program would be $8.50 per pupil, which includes the cost of providing one commercial textbook for every three students. Maintenance costs after the initial year would be minimal.

CURRENT STATUS AND CONTACTS

During the 1975-76 school year COMP was funded as a U.S.O.E. Developer/Demonstration Project. Over 135 educators from fourteen states have seen the program in operation and the staff of Project COMP has provided awareness and/or training sessions in fifteen states.

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

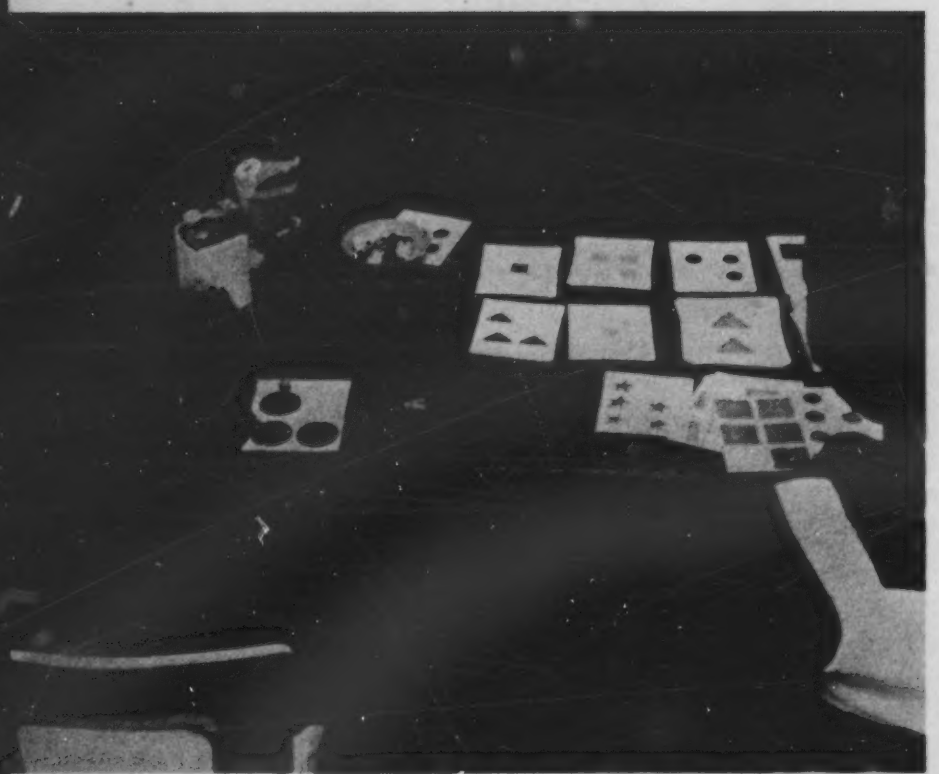
Send for Pamphlet No. **M3.**

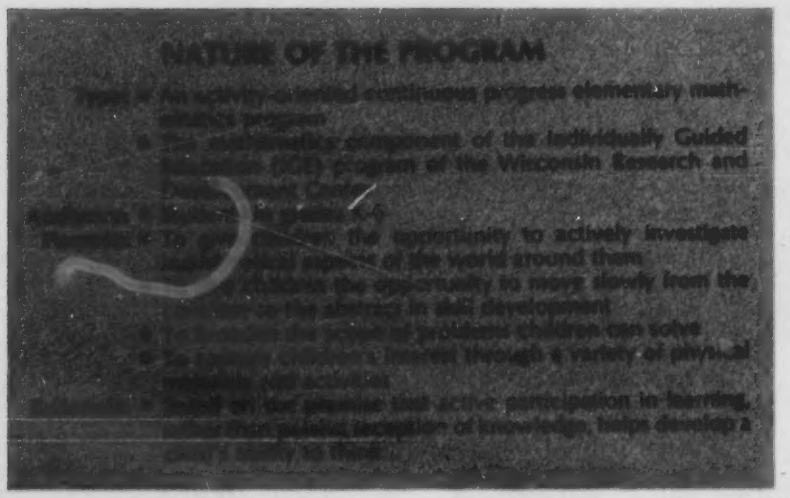
Additional information may be obtained from:

Alta M. Harness, Director
Conceptually Oriented Mathematics Program
Columbia Public Schools
1002 Range Lane
Columbia, Missouri 65201
(314) 443-2561 EXT 234

DEVELOPING MATHEMATICAL PROCESSES

Rand McNally & Co.
Chicago, Illinois





WHAT HAS THE PROGRAM ACHIEVED?

Pretest/posttest gains of project students on the math subtest of the *Stanford Early School Achievement Test* were significant at the .05 level. No significant difference was found between the math scores of students who used the *DMP* materials and the scores of similar students who had been using a popular elementary math program. However, the direction of the differences generally favored the *DMP* groups.

HOW DOES THE PROGRAM WORK?

Organization: The basic theme underlying *DMP* is problem-solving, and the program aims to broaden the scope of problems children can solve. Ninety *DMP* topics are built around a set of hierarchically-related objectives. These are clustered into content areas that are typical to most elementary mathematics

programs. Progress through the topics need not be in a linear order, allowing for a variety of learning routes and instructional groupings. Each topic has a specific purpose, and activities are carefully sequenced so that students master the objectives in a step-by-step progression. In *DMP*, mathematics is approached through the measurement of attributes, and problem-solving experiences are structured so that students move slowly from the concrete to the abstract. Although *DMP* is basically ungraded, approximate grade levels have been designated for the materials.

Materials and activities: The program provides assessment and record keeping materials, student practice booklets, nonconsumable student guide books for the intermediate levels, and a great variety of manipulative materials. Emphasis in the program is upon active student involvement and a completely individualized program for each child.

After students' levels of mastery for the various objectives have been determined, activities are structured which will aid them to achieve the objectives for a targeted topic. *DMP* provides considerable variety in terms of the types of activities as well as the types of instructional groups. Based upon the premise that different children respond best to different types of organization, the activities are structured for large groups, small groups, pairs, or individuals. Opportunities are also provided for peer teaching, goal setting, and small group conferences.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: A *DMP* program coordinator is assigned to the adopting school district to assist staff members install the program and to monitor its implementation. Inservice training is provided in areas related to *DMP* assessment procedures, *DMP* content and processes, an activity approach, and individualized grouping techniques.

Cost: *DMP* materials kits may be purchased individually or in a Complete Kit, containing all materials necessary for a teacher and 32 students at each level. The costs of the Complete Kits are as follows:

Level K (Topics 1-14)	$226.00
Level 1 (Topics 15-27)	$410.00
Level 2 (Topics 28-40)	$446.00
Level 3 (Topics 41-52)	$525.00
Level 4 (Topics 53-65)	$478.00
Level 5 (Topics 66-77)	$540.00
Level 6 (Topics 78-90)	$561.00

A complete price list of individual kits and replacement items is available from Rand McNally upon request.

CURRENT STATUS AND CONTACTS

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

Send for Pamphlet No. **M4.**

Information concerning classroom test results, implementation programs, and training materials may be obtained from:

Dr. James M. Moser
DMP Project Coordinator
1025 W. Johnson Street
Madison, Wisconsin 53707
(608) 263-4285

Materials can be secured from any of the following Rand McNally representatives:

Mr. Leo Fallon
15 Monticello Drive
Howell, New Jersey 07731
(201) 364-3296

Mr. Dick Lapham
714 Howell Drive, P.O. Box 98
Brielle, New Jersey 08730
(201) 528-5252

Mr. Robert Strait
105 Lafayette Avenue
Park Ridge, New Jersey 07656
(201) 391-8865

DISTAR®
ARITHMETIC

Distar® Instructional System
Science Research Associates
Chicago, Illinois

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WHAT HAS THE PROGRAM ACHIEVED?

Several studies indicate that the Distar Arithmetic Program, when used in conjunction with Distar Reading and Language Programs, has a substantial impact on the achievement of inner-city and rural students, and students with learning difficulties. The mean grade scores of first and second grade students in six Alabama schools on the SRA Achievement Series were significantly higher after their participation in the program. Inner city children in Flint, Michigan also showed significant improvement on achievement test performance after a year in the program.

HOW DOES THE PROGRAM WORK?

Organization: The Distar Arithmetic program is organized into three consecutive levels, Arithmetic I, II, and III. Specific educational objectives are stated as a series of tasks which are organized into sequenced lessons. Each level contains 160 lessons, requiring approximately a year for completion. However, the curriculum is ungraded and instruction is individualized so that some children may finish a level in less than a year, thus moving into the next level, while others may require more than a year to complete a level. A detailed teacher's script is provided for each lesson, and correction and recycling procedures are built into the program. The main goal of the program is to ensure development of essential arithmetic concepts and skills for all children, regardless of the amount of time necessary for that development. Each child has the same set of educational objectives and must master the same set of skills before moving on to more complicated concepts.

Arithmetic I curriculum includes the following: 1) the basic operations of addition, subtraction, and algebra addition; 2) simple story problems involving addition, subtraction, and the signs > and <; 3) application of ordinal counting to simple picture problems; and 4) derivation of new arithmetic facts from an understanding of approximately 35 basic facts.

Arithmetic II stresses independence in problem solving and includes the following new skills: 1) multiplication and algebra multiplication; 2) two-digit column addition and subtraction; 3) adding, reducing and multiplying fractions; 4) length and weight measurement; 5) coin problems; and 6) telling time.

Arithmetic III continues to broaden skills taught in I and II and introduces: 1) formal problem-solving procedures such as moving terms across the equal sign, factoring, analogies, and strategies for handling relatively complex word problems; 2) conventional operations of multiple-place column addition, subtraction, and multiplication; and 3) long division with fractional remainders.

In Arithmetic I and II, classes are organized into three homogeneous groups according to approximate level of skill development. Individual skill development is evaluated daily and the groups are flexible, allowing children to move from one group to another according to need. Use of teacher aides would permit simultaneous lesson presentations in different parts of the classroom. Daily lessons last approximately one hour and ten minutes and consist predominately of small-group activity, independent seat work, and individual work check. Lessons for Arithmetic III are designed for either large-group or small-group presentation.

Materials and activities: Student materials for Distar Arithmetic I and II consist of a set of three Take-Home books for each child. These workbooks contain skill-reinforcing written activity sheets which may be removed from the books and taken home to parents when a child successfully completes a lesson. The Take-Homes serve as incentives for the child and help parents become involved in the child's school work. The Arithmetic III program also uses workbooks for skill reinforcement and student evaluation. Numerous in-program mastery tests are used for student assessment on all three levels.

Lessons generally take the form of small-group instruction followed by drill, group and individual choral response, and independent seat work. Seat work is checked daily, and reteaching or modeling of a skill occurs as soon as an error is detected. Precisely structured lesson presentations and recycling procedures (provided in a Teacher Kit) and daily evaluation of individual student skill development are essential aspects of the Distar Instructional System.

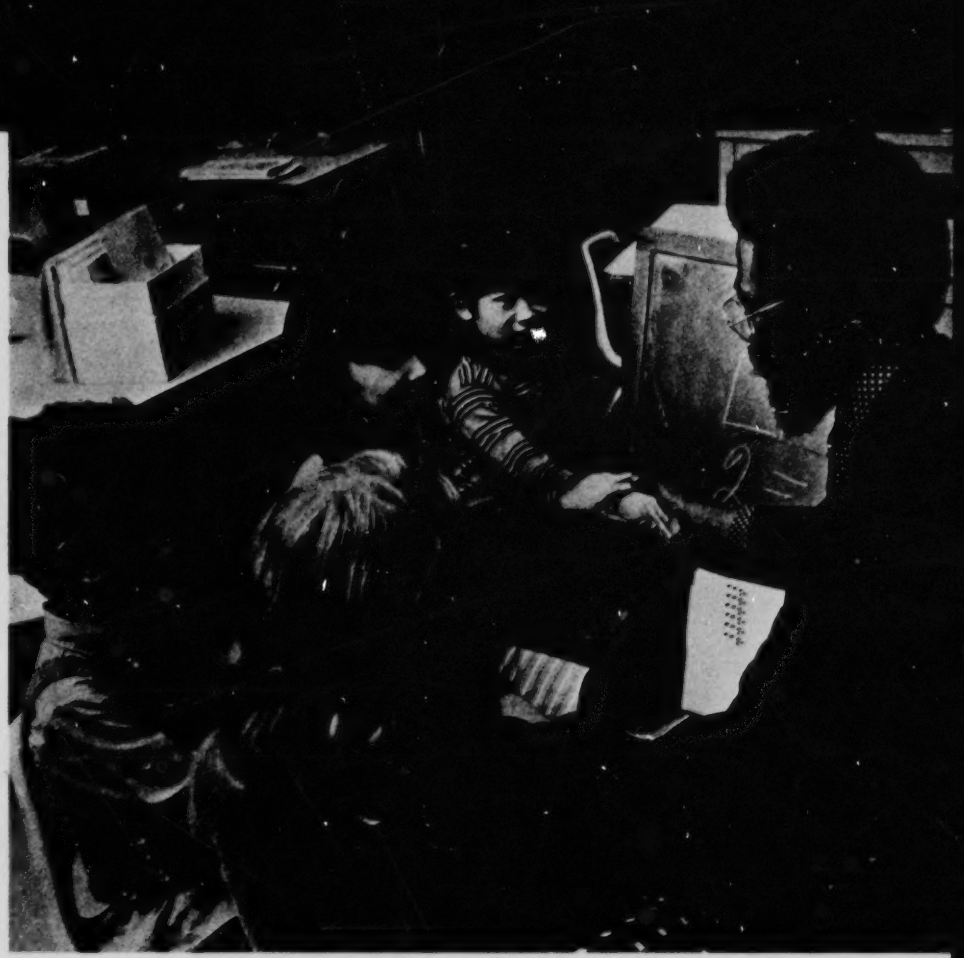
WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: A preservice workshop and inservice sessions, for both teachers and teacher-aides, may be arranged through a Science Research Associates (SRA) area office. A Distar consultant will be sent to the school, free of charge, at the school's convenience. Teachers are provided with a Teacher Kit for each of the three levels of the program. These kits contain: A Teacher's Guide; Teacher Presentation Books including a detailed script for each lesson; group progress indicators and teacher editions of the workbooks; and Geometric Figure Cards, fact and quota cards for the Fact Game, and instructions for their use.

Costs: The cost of implementing the program is as follows:

	List Price	Net Price
Distar Arithmetic I		
Teacher Kit	$166.67	$125.00
Set of three student Take-Home books per student	5.67	4.25
Distar Arithmetic II		
Teacher Kit	166.67	125.00
Set of three student Take-Home books per student	5.67	4.25
Distar Arithmetic III		
Teacher Kit	121.33	91.00
Set of three student workbooks per student	5.67	4.25
Supplements		
Distar and Strategy Game	33.33	25.00

All materials and equipment necessary for the Distar Arithmetic program are included in the three Teacher Kits and the packaged student materials. Annual maintenance costs are $4.25 per student.



CURRENT STATUS AND CONTACTS

The Distar Instructional System and materials are based on work done by Siegfried Engelmann and colleagues at the University of Illinois and are published by Science Research Associates (SRA), Chicago.

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

Send for Pamphlet No. **M6**

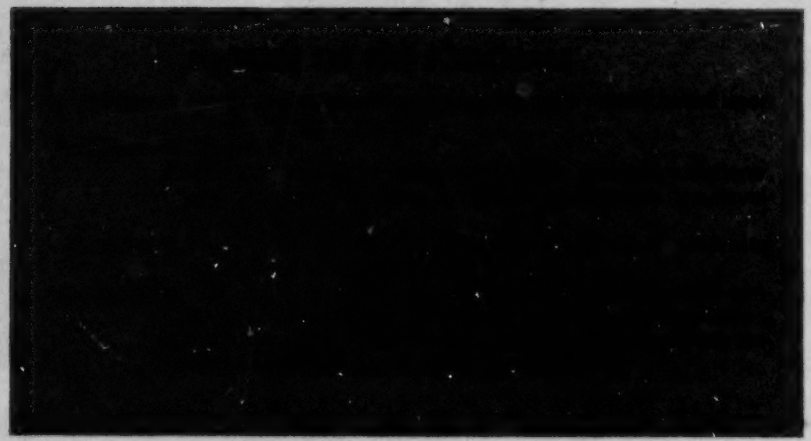
Additional information may be obtained from:

Science Research Associates
259 East Erie Street
Chicago, Illinois 60611
Phone: 800-621-6468

SRA New Jersey Office:
John Plastas
Dayton, New Jersey
Phone: 201-329-1219

EDUCATIONAL DEVELOPMENTAL LABORATORIES (EDL) MATHEMATICS SYSTEM

A Division of McGraw/Hill
Hightstown, New Jersey



WHAT HAS THE PROGRAM ACHIEVED?

Educational Developmental Laboratories has maintained ongoing evaluation of this program as a facet of product development. Numerous formative and summative evaluations are currently in process. In one study conducted in a junior high school in Virginia and using an experimental/control group design, students were pre- and posttested on the *California Achievement Test* after the materials had been used for seven months. In each instance reported, the experimental group's gains were more than twice as large as the control group's.

HOW DOES THE PROGRAM WORK?

Organization: The EDL Mathematics System is a multi-media program with specific performance objectives organized into a series of 156 instructional cycles. Each cycle utilizes six different modes of instruction: listening; manipulation and modeling (hands-on); sight/sound; homework sheets; paced visual drill; and games. Instruction in each cycle includes:

1. a review of prerequisites (listening lesson)
2. concept introduction (hands-on modeling)
3. concept development (sight/sound instruction)
4. written practice (pencil/paper)
5. paced drill (filmstrip with speed devices)
6. reinforcement (games and activities)

The program is very flexible, and may be used developmentally or for purposes of remediation. Activities are self-instructional.

Materials and activities: Materials provided for the teacher include: 1) a System Manual which overviews the entire system; 2) a Cycle Guide which summarizes all of the materials in each of the cycles; and 3) Teacher Guides for each segment of the program. Materials used for the program activities include filmstrips, sound cassettes, manipulatives, response books, performance objectives, and homework sheets.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: Inservice training is necessary to familiarize a staff with the program's equipment and materials.

Educational Developmental Laboratories maintains a demonstration classroom in Hightstown, New Jersey. An EDL Mathematics consultant also aids schools during the installation and initial implementation of the program and is available to help teachers on a continuing basis.

Costs: Costs for implementing the program will vary, depending upon local decisions and existing resources. EDL estimates that start-up costs range from $3,000 to $7,000 per laboratory.

The annual maintenance and replacement costs range from $300 to $400 per laboratory.

CURRENT STATUS AND CONTACTS

The program is fully operational and available through EDL/McGraw Hill, Hightstown, New Jersey. Research, evaluation, revision, and augmentation are continuing.

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

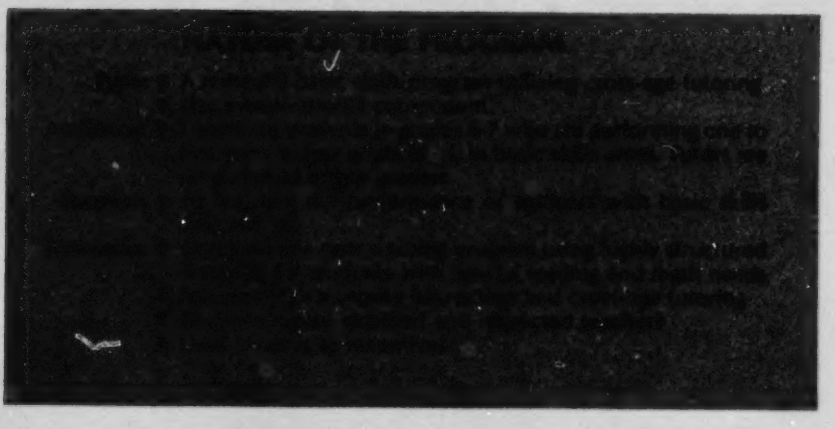
Send for Pamphlet No. **M7.**

Additional information may be obtained from:

Mr. Kermit Boston, Branch Manager
McGraw-Hill Book Company
Princeton Road
Hightstown, New Jersey 08520
(609) 448-1700, EXT. 5604

HIGH INTENSITY TUTORING (HIT)

Highland Park, Michigan



WHAT HAS THE PROGRAM ACHIEVED?

As a result of participation in High Intensity Tutoring (HIT), participants made significant gains in the basic skills areas of reading and math. On the *Wide Range Achievement Test (WRAT)* in 1971-72, HIT tutors and tutees in reading and math averaged gains of between .334 and .73 of a standard deviation in relation to the national norm. These findings went beyond the effectiveness criterion which was established for the project. From evaluation data collected in 1972-73, gains for participants exceeded those of non-participants and moved participants substantially closer to the national norm. These gains ranged from 1.2 to 3.7 months per month for tutees and tutors on the *WRAT*.

HOW DOES THE PROGRAM WORK?

Organization: HIT is a cross-age tutoring program for students in grades 6-8, who require remedial work in reading and math. The program is conducted in a reading center and a math center, each of which is staffed by a teacher and two paraprofessionals. Participants in the program are either tutees (sixth and seventh graders with a demonstrated need for remedial work) or tutors (seventh and eighth grade volunteers who themselves need help which they receive

through tutoring). Tutees and tutors leave their regular classrooms to report to the centers where they work in pairs with a variety of drill and programmed materials. Teachers and aides provide assistance when needed.

The HIT program has an instructional component and a motivational component. Program materials are carefully assigned by teachers so that students obtain over 90% accuracy in their daily work. Correct responses are calculated daily in terms of points which can be redeemed for tangible rewards.

Materials and activities: Instruction in both centers focuses on drills in basic skills, and practice through programmed materials which are used simultaneously by tutor and tutee. Drill takes place during the first 10 minutes of the period, with materials designed to teach basic sight vocabulary in reading and basic facts in math. For the remaining 20 minutes of the period, carefully structured programmed reading and math booklets are used to teach comprehension and problem-solving skills. All reading is oral; writing is used only when necessary as in problem-solving. Tutees provide responses which are quickly checked by tutors. Correct responses receive points which are recorded in daily records and later redeemed for rewards (normally candy). Tutee work with sequential booklets, and assignment adjustments are determined by individual need.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: Some staff training is recommended. A Project Information Package (PIP) describing how to install the successful features of this project is available. This package contains Training Manuals.

Visitors are also welcome at the Developer site from October 15 through May 1. Arrangements can be made for training at this site or at an adopter site.

Cost: HIT is a program which qualifies for Title I funds. Costs will vary, depending on the particular needs and resources of an adopting district. Estimated start-up costs are approximately $5,000 per center (reading and math). Most instructional materials are reusable; however, funds need to be budgeted for such items as rewards.

CURRENT STATUS AND CONTACTS

A Project Information Package (PIP) is available for this project. Information about obtaining a PIP for this program is available from:

Dr. Francis Thompson
ECOS Training Institute
833 Foxmeadow Road
Yorktown Heights, New York 10598
(914) 245-4009

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

Send for Pamphlet No. **RM10.**

Further information about HIT can be obtained from:

Mrs. Betty A. Colden, Director
School Board of Highland Park
20 Bartlett Street
Highland Park, Michigan 48203
(313) 868-1264

REFERENCES

Project Information Package (PIP): HIT Project Management Director
HIT Teacher's Manual
High Intensity Tutoring Project Analysis and Selection Kit Description Booklet
Project Orientation Materials

INDIVIDUALIZED LEARNING FOR ADULTS (ILA)

Research for Better Schools, Inc.
Philadelphia, Pennsylvania 19103

WHAT HAS THE PROGRAM ACHIEVED?

Organization: The *ILA* curriculum consists of 238 performance objectives in both mathematics and communication skills. Learning tasks are arranged systematically. Diagnostic tests determine student needs and appropriate work is assigned by the teacher accordingly. Aides are used to score tests, tabulate data, and maintain student files.

Materials and activities: Each *ILA* performance objective is accompanied by an Instructional Booklet. These booklets are largely self-instructional, and include skill tests for self-checking. The management plan of diagnostic testing and individualized pacing provides systematic and constant tracking of each student's progress. Entrance tests, prescription booklets, teachers manuals, and student Profiles are available at cost for both the *ILA* Mathematics and Communications Skills.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: Inservice training is needed for initial teacher familiarization with the *ILA* format. Training sessions are provided by representatives of Research for Better Schools, Inc. Utilizing the detailed training manual, teacher training can easily be completed in two days.

Cost: The complete introductory program in Communication Skills for a sample group of fifty *ILA* students costs $1,373.66. A similar package for fifty *ILA* students in Mathematics came to $2,878.94. Because the *ILA* materials are specifically designed to be consumed annually, replacement costs are the same as start-up costs.

CURRENT STATUS AND CONTACTS

The program was developed by Research for Better Schools, Inc., to combat the serious deficiencies in literacy faced by 4% of our population over 16. Nationwide interest has been expressed in establishing *ILA* sites in a dozen states. Consultant services for the implementation of *ILA* are available on request from RBS.

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

Send for Pamphlet No. **RM1.**

Additional information may be obtained from:

Marketing Division (ILA)
Research for Better Schools, Inc.
1700 Market St.
Philadelphia, Pa. 19103
(215) 561-4100

PROJECT R-3

Herbert Hoover Junior High School
San Jose, California

WHAT HAS THE PROGRAM ACHIEVED?

Pre-post test achievement gains were compared to national norms and to control groups for some elements. Tests used were the *California Test of Basic Skills* and the *California Achievement Test.* The program was shown to be successful in improving reading and mathematics achievement scores, and in producing positive attitude changes toward school. Each year, the gains made by the R-3 students were significantly greater than those of control groups, and greater than growth rates reflected by norms.

The overall reading achievement gain for 1972-73 on the *California Test of Basic Skills,* Form R, Level 3, exceeded normal expectation by three months. Per month average gains were 1.4. Reading achievement was greater in comprehension than vocabulary which reflects the project's emphasis on understanding and reinforcement through gaming/simulation. The overall mathematics achievement gain for 1972-73 on the *California Test of Basic Skills* was two years for eight months in the program. Highest gains were in Computation and Concepts (2.3 and 1.9); the lowest gain was in Arithmetic Applications (1.3).

HOW DOES THE PROGRAM WORK?

Organization: Students meet each morning for three 50 minute periods devoted to reading, math, and a special *R-3* activity designed to show the relationships of classroom instruction to the solution of real world problems. Each *R-3* unit is designed around a core subject related to a cluster of occupations. These units usually operate for two weeks, and fourteen such units make up the entire program. Two of the segments, each a week long and known as high intensity involvement periods, are highly structured field trips to locations distant from the school. Classrooms are colorfully and attractively redesigned as learning labs and are staffed by one teacher and one aide for up to 22 heterogeneously grouped students.

The *R-3* staff is comprised of a full-time project director and secretary, teachers, instructional aides, and a curriculum resource teacher.

Materials and activities: Diagnostic instruments provide an item analysis of student performance to develop a profile on each student in the first two weeks of the program. In reading, skills are clustered in the areas of comprehension, study skills, vocabulary, and reading habits. Math skills are also clustered in various areas of performance objectives. Student profiles are updated periodically in both content areas. Each module has a packet of materials prepared for the teacher which includes the following: general mathematics and reading objectives; specific behavioral objectives for each module; two-week lesson plans; specific lesson games; descriptions of relevant field trips; and evaluation forms. Commercial materials are used and sequenced to staff-selected learning events. The program employs an eclectic approach to reading instruction. The language experience approach is used as the basis of most instruction, but phonics, aural/oral, and linguistic procedures are used when warranted. A laboratory approach is used in the mathematics instruction area. Both approaches are facilitated by peer tutoring and learning machines. Learning contracts covering the full range of supplementary materials are also developed. Student profile sheets are used for assessment and record purposes.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: Some inservice training is required to master the *R-3* activity components. Training materials for *R-3* have been packaged as part of a Project Information Package (PIP) developed by the U.S. Office of Education in order to diffuse this project on a national scale.

Cost: It is assumed that classrooms are already provided for each of the school's existing teachers associated with the project. The project furnishes each classroom with hexagonal tables, chairs, and carpeting to enhance flexibility and reduce noise. In addition, the project requires a standard classroom for each cadre staff teacher, a meeting room, and fully equipped offices for the project

director and secretary, and the curriculum resource teacher. The program's multi-media approach requires a variety of audio-visual aids and equipment. Costs to implement the program would vary depending upon local decisions, and relate mainly to salaries, materials and equipment, and field trips. In addition to staff salaries, start up costs for nine classrooms servicing between 264-300 students amount to about $21,000. These costs recur for six new classrooms per year for the second and third years. Annual costs for nine classrooms are estimated at $17,000.

CURRENT STATUS AND CONTACTS

Project R-3 in San Jose, California is now in its ninth year of operation. It has been expanded to over 14 school districts across the country. It has been packaged by the U.S. Office of Education as a Project Information Package (PIP) for national diffusion.

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

Send for Pamphlet No. **RM5.**

Additional information may be obtained from:

Ms. Pauline E. Perazzo
Herbert Hoover Junior High School
1450 Naglee Avenue
San Jose, California 95126
(408) 998-6274

OR

Dr. Francis Thompson
PIP Diffusion Director
ECOS Training Institute
833 Foxmeadow Road
Yorktown Heights, New York 10598
(914) 245-4009

PROJECT SAIL: STUDENT ACHIEVEMENT IN INDIVIDUALIZED LEARNING

Wharton, New Jersey

WHAT HAS THE PROGRAM ACHIEVED?

The effects of SAIL were evaluated for three groups of students who had been in the program for consecutive years in grades 6 and 7. Program students were compared to a control group of students who attended the same school prior to Project SAIL implementation. Evidence from school records indicated that the program students and control students were basically similar. In addition, the statistical procedure used, analysis of covariance, controlled for any initial differences between groups on pretest scores and IQ scores in the analysis of the posttest results. The math portion of the *California Achievement Test* was used as the pre- and posttest measure. Results over the three year period were consistently positive. Students exposed to two years of Project SAIL significantly outperformed nonproject students in total math achievement. Program students also significantly improved their ability to perform math computations. At the end of

the two year period, SAIL students were above the seventh grade level achievement expectations. In addition, on the New Jersey State Tests, Project SAIL students outscored all other student groups available for comparison.

HOW DOES THE PROGRAM WORK?

Organization: The 25 Project SAIL mathematics topics are placed in a logical order for learning that forms a sequenced concepts and skills hierarchy. All instructional materials are coded according to the concepts and skills sequence. Student profiles outline student areas of strength and deficit as indicated by the diagnostic process. Prescriptive programming includes many learning activity modes including small group instruction, conferences, game activities, and individual student-to-student and teacher-to-student tutoring. Initially, the teacher directs students to the appropriate prescriptive assignments; however, as the students become more familiar with the SAIL program, they assume more responsibility for the learning process. Students participate in the SAIL program for approximately 45 minutes per day, 5 days per week.

Materials and activities: SAIL uses a General Diagnostic Test to precisely determine the achievement level of each student so that appropriate prescriptions can be made. In its prescriptive planning, Project SAIL stresses the use of a wide variety of teacher-made and commercial materials usually available in the math classroom. Supplementary materials, while helpful, are not required for program implementation. Project-developed Learning Booklets are used for the prescriptive assignments which are planned for each student. Pretests and achievement tests for each topic are used to gauge each student's progress in the attainment of particular concepts or skills. Student Record Sheets are used to monitor student progress.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

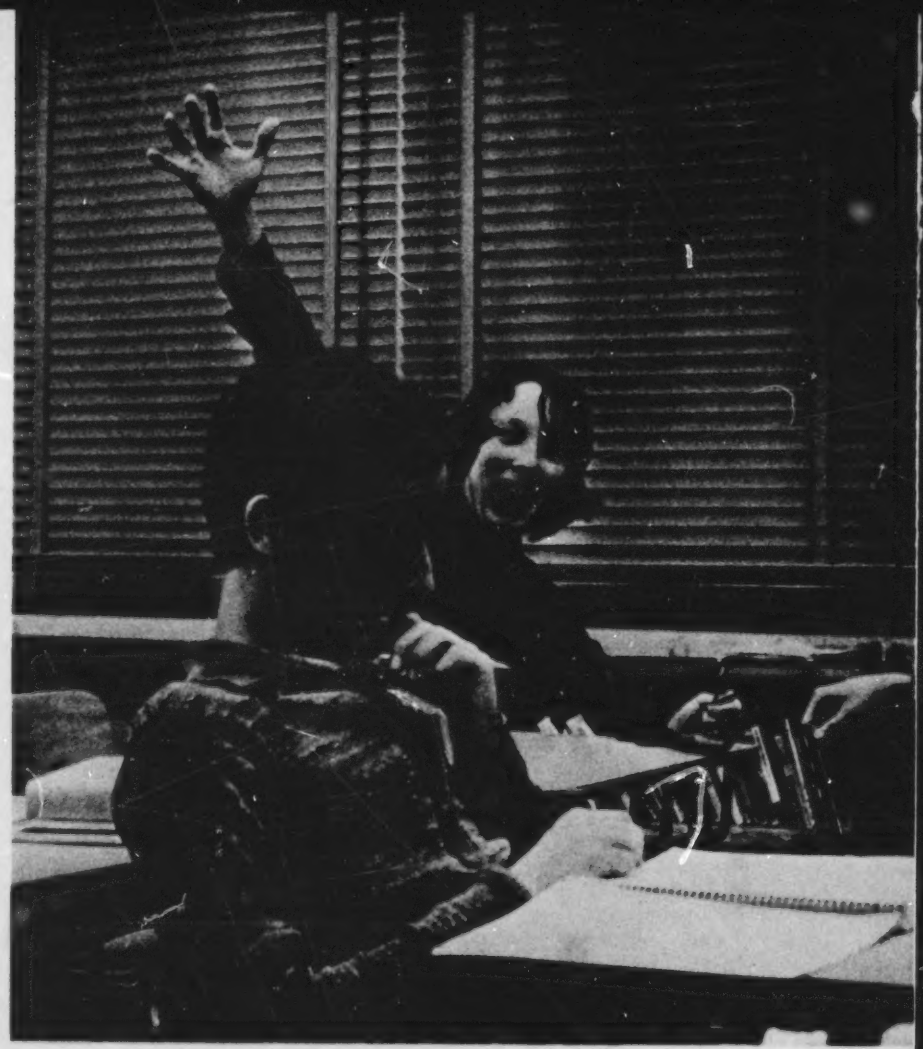
Staff training: Although Project SAIL can be implemented through the use of the program manual and materials, it is suggested that both teachers and administrators participate in a one day orientation workshop prior to adoption. This workshop includes instruction in classroom management techniques, and in the use of student records, pretests and achievement tests. Consultative services are available through Project SAIL to aid in program implementation and orientation training. In addition, SAIL can provide a filmstrip/cassette tape description of the program to potential adopter/adapter schools.

Cost: Installation costs for SAIL are estimated to be approximately $85 per classroom which is a per student cost of $3.43. This includes the cost of project-designed materials required for SAIL, file folders, and a file cabinet. Annual operational costs are projected to be about $12 per classroom.

CURRENT STATUS AND CONTACTS

This program was nationally validated during the 1975-76 school year. Additional dissemination materials are currently being developed.

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.



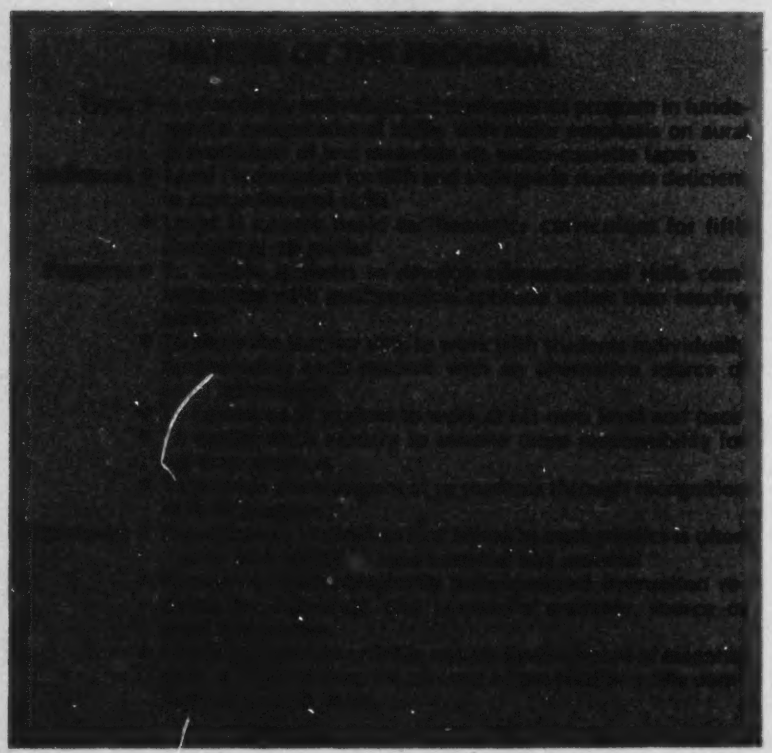
Send for Pamphlet No. **M15.**

Additional information may be obtained from:

Mr. Michael H. Stillman
Project Director
Project SAIL
MacKinnon Middle School
Wharton, New Jersey 07885
(201) 361-2506

PROJECT SMART: SUCCESS IN MATHEMATICS THROUGH AURAL READING TECHNIQUES

Volusia County Educational Development Center
Daytona, Florida



WHAT HAS THE PROGRAM ACHIEVED?

An experimental/control group design was employed to evaluate the program. The groups were heterogeneous, matched for grade, and of comparable IQ and mathematical ability. All students were pre- and posttested, using the *Stanford Math Achievement Test* and a criterion-referenced math survey instrument entitled the *Volusia County Math Symbols and Vocabulary Test.* On all tests, the difference in gains between the experimental and control groups were in favor of Project SMART students and were statistically significant at the .01 level.

HOW DOES THE PROGRAM WORK?

Organization: The major goal of Project SMART is to enable fifth and sixth grade students to use computational skills more nearly commensurate with their mathematical aptitude. The program intent is to overcome student difficulties with mathematics which are related to poor reading skills. Prepared cassette tapes are used to individualize the aural presentation of the text materials, and students work at their own ability levels and proceed at their own pace.

The Project SMART curriculum is organized into two levels. Level I is designed for students operating below the fifth grade level of mathematical achievement, and Level II for fifth grade achievement level and above. The curriculum is divided into approximately 40 units of work which range in content from number recognition to elementary algebra and geometry. Level I units cover number readiness, the fundamental operations on whole numbers, and fractions. Level II units offer a greater variety of material and more challenging problem situations, and are presented both on prerecorded tape cassettes and in coordinated student booklets.

Materials and Activities: The materials for each unit consist of student booklets, tapes to accompany the booklets, and tests. Other materials developed by the project staff include diagnostic tests, student progress sheets, a teacher's manual and key to tests, a lab manual, and various supplementary materials. After the student's mathematical achievement level has been diagnosed, he is placed in an appropriate unit and assigned a study booklet and accompanying tape. Each booklet contains worksheet outlines, explanations, practice exercises, review exercises, and self tests. The tapes provide detailed explanations of concepts, and guide the student through mathematical processes in small steps which follow the worksheet outlines. Students are encouraged to accept responsibility for their own progress, and complete a self test which is provided in the booklet. Successful completion of the self test is followed by a unit achievement test administered by the teacher.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: Inservice training is not considered essential if an adequate preservice program is conducted. This consists of spending three or four days at the project site in order to observe SMART classes in operation, and to become familiar with the SMART curriculum, hardware, software, and the teacher's manual. Training and technical assistance are available upon request.

Cost: Both Levels I and II of Project SMART require student booklets, tests, and tapes to accompany the booklets.

Initial implementation costs also include the purchase of cassette players, headsets, and other hardware. Startup costs based on a total fifth and sixth grade population of 180 students, and class size no larger than 33 students, are estimated at $7.94 per student.

Ongoing maintenance costs are estimated at $100 per year, plus replacement of software. Costs per student for three years (initial and maintenance) are estimated at approximately $3.00

CURRENT STATUS AND CONTACTS

In 1973, the project was validated as a Title III Demonstration-Diffusion Center, and dissemination activities have been conducted on a national scale. As of October, 1976, the program has been supported by local funds. Materials, training and technical assistance are available, and demonstration sites may be visited at Daytona Beach.

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

Send for Pamphlet No. **M16.**

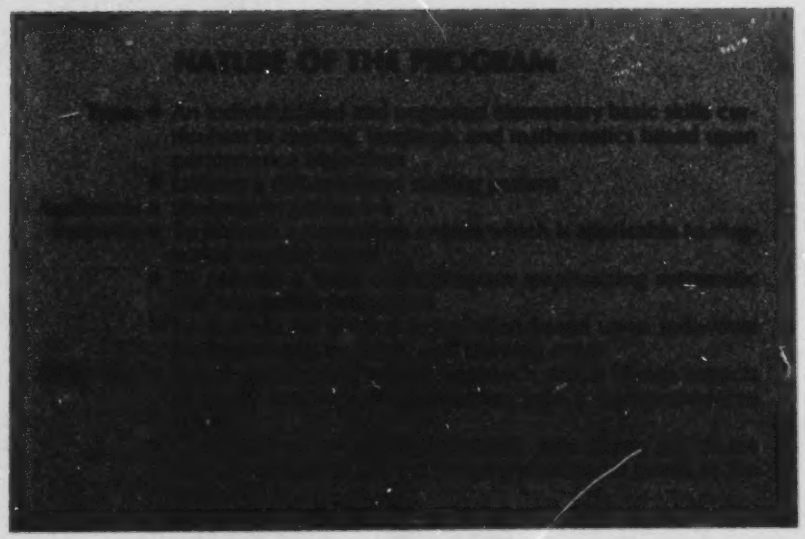
Additional information may be obtained from:
Jack Duncan, Project Manager

Frank Sganga, Project Director
Educational Development Center
Box 1910
Daytona Beach, Florida 32015
(904) 255-6475

SYSTEMS APPROACH TO INDIVIDUALIZED INSTRUCTION

(The Manzanita Curriculum Design Project)

Manzanita Elementary School
Grants Pass, Oregon



WHAT HAS THE PROGRAM ACHIEVED?

The effects of the program were measured in two ways. Alternate forms of the *California Achievement Test* (CAT) were administered to all students on a pre- and posttest basis. Differences between pre- and posttest performance were computed and tested for significance. In addition, grade level mean test scores from the years immediately preceding the project were used as a baseline against which project accomplishments were measured. The data indicated a general reversal of declining performance trends which were apparent in the baseline data.

Another comparison involved student performance on pre- and posttests during the project year. While the average amount of gain in mastery differed from group to group, a statistically significant gain occurred at each grade level.

HOW DOES THE PROGRAM WORK?

Organization: The program is organized around a hierarchical list of skills for each of several concept areas, with instructional objectives for each skill. Program Management Units (PMU's) support each set of objectives and provide learning activities and alternate routes of instruction. The amount of time a student devotes to the program varies, reflecting his unique needs and individual style of learning, as well as his own rate of progress. Teacher aides are helpful in the implementation of the program. However, the program has been implemented and tested in schools where no aides were available. Classroom organization may vary from self-contained classrooms with a single teacher to unit arrangements with differentiated staffing, depending upon available staff and facilities.

Materials and activities: The teacher is provided with a hierarchical list of skills for each concept area, instructional objectives for each skill, and necessary pre- and posttests. PMU's providing varied learning activities are available for each studen Additional materials may include films, tapes, consumable paper items and games. Pre-tests are used to determine the student's position on appropriate skill levels. As the student works through successive PMU's, he is administered posttests which he must pass with a 90% mastery before progressing. If a student fails a posttest, he is recycled through another PMU. Second posttests are administered 5 weeks later to determine skill retention.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: General inservice training relating to the varied instructional procedures and multi-media resources of this program is helpful to successful implementation. No special training is required for teacher aides.

Cost: The program requires facilities that promote flexibility of instruction, but such facilities could be developed within most existing school structures. Individual and small group learning stations, areas for larger meetings, open areas, and provisions for materials storage are required. The program tends to be media rich and requires larger numbers of cassette recorders, film strip viewers, and similar equipment, than are normally stocked. The per student installation cost is $20.85. Once installed, the program costs no more than a conventional program. Operational costs of the project elementary school are estimated at $420 per year for the total program.

CURRENT STATUS AND CONTACTS

At the present time, the program is fully operational at all grade levels at the Manzanita Elementary School.

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

Send for Pamphlet No. **RM6.**

Additional information may be obtained from:
Josephine County School District
Manzanita Elementary School
"A Systems Approach to Individualized Instruction"
310 San Francisco Street
Grants Pass, Oregon 97526
Telephone: (503) 479-6313

SUPPLEMENTARY PROGRAMS OR SERVICES

DIAGNOSTIC PRESCRIPTIVE ARITHMETIC

Staten Island
New York City Board of Education
Community School District 31
Staten Island, New York

WHAT HAS THE PROGRAM ACHIEVED?

In order to evaluate the impact of the *DPA* program on student achievement, all project students in grades 3, 4, and 5 were administered the *Stanford Diagnostic Arithmetic Test* (concepts subtest and computations subtest) at the beginning of the school year, and again after seven months of program participation. Results indicated that the *DPA* program exceeded its objective: The *DPA* program raised the mean posttest mathematics achievement level above the mean expected posttest mathematics achievement level for all three grades. (The expected mean was calculated from student's previous achievement rates.) The *DPA* program students averaged increases of 1.5 grade equivalent units in the seven months from pre- to posttest.

HOW DOES THE PROGRAM WORK?

Organization: *DPA* is the arithmetic component of a total mathematics program, and should be balanced with the other mathematics topics of the curriculum. Over 75 activities are presented through a diagnostic-prescriptive approach to the teaching of basic concepts and skills. The activities relate to such areas as counting, place value, addition, subtraction, multiplication, and division of whole numbers; they provide experiences for concept development, reinforcement, and practice and drill.

Materials and activities: A Teacher's Manual includes activity descriptions, record keeping procedures and devices, instructions for developing a variety of "teacher-made" materials, alternative approaches for implementing an individualized activity-oriented program, and a listing of the commercial resource materials used in the program. Most of the classroom materials can be teacher-made with the manual of instructions. Other essential materials include cubical counting blocks, graph paper, calculators, the *Stanford Diagnostic Arithmetic Test*, and a variety of mathematical games.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: Some training is needed prior to the implementation of this program which relates to such areas as diagnostic techniques, prescriptive approaches, classroom management, and the preparation of instructional materials. The project staff welcomes visitors to view the program, and arrangements can be made for *DPA* training workshops.

Costs: Start-up costs for program materials are approximately $120 per classroom. Replacement costs for program materials amount to about $38 per classroom.

CURRENT STATUS AND CONTACTS

This program has been nationally validated and is currently an ESEA Title III, IV-C Developer/Demonstrator Project within the U.S. Office of Education National Diffusion Network.

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

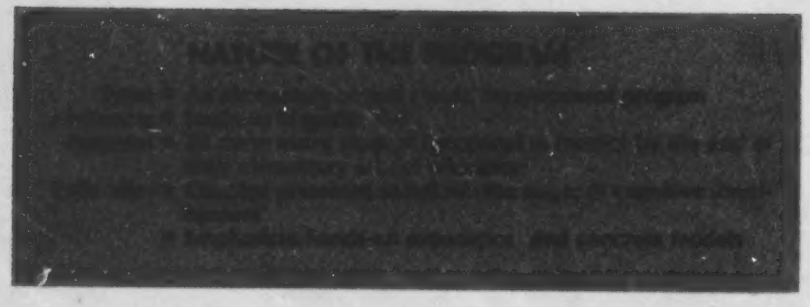
Send for Pamphlet No. **M5.**

Additional information may be obtained from:

Mr. Matthew Scaffa
C.S.B. District 31
211 Daniel Low Terrace
Staten Island, New York 10301
(212) 447-5281

METRICS-HAWAII METRIC PROGRAM

The 4M Company
University of Hawaii
Honolulu, Hawaii 96822



WHAT HAS THE PROGRAM ACHIEVED?

The evaluation of the METRICS program focused upon four areas: curriculum materials, teacher reactions to materials, student performance, and satisfaction with training. Descriptive data was provided, which indicated that materials were well organized and that teachers were favorably impressed with the program and training sessions. Students also performed well on a project designed instrument, with 80% passing the majority of test items.

HOW DOES THE PROGRAM WORK?

Organization: The program is a complete and comprehensive measurement program which leads the student from premeasurement skills to a functional, working knowledge of the metric system. Topics include length, capacity, weight, temperature, perimeter, area, and volume. Computation with decimals is presented as a natural part of the metric system.

Materials and activities: Each teacher is provided with a teacher's guide and each student is provided with a consumable workbook. A typical lesson begins with a group presentation or discussion. Students then work in small groups to complete a variety of activities, the results of which are usually recorded in the student booklets. Students work as individuals to complete exercises in their workbooks. The teacher concludes the lesson with a group discussion which summarizes the lesson.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: If teachers do not know the metric system, it is recommended that they attend a metric workshop. Some teachers have been successful without attending the workshop.

In Hawaii the College of Education, University of Hawaii, has been offering 1-credit metric workshops free of charge. The teacher's guide also contains a Make Mine Metric mini-course, a fifteen page summary of the metric system.

Cost: The following table shows the costs for a class of 25 students:

Grades	*K*	*1*	*2*	*3*	*4*
Booklets	$10.25	$11.50	$11.50	$12.75	$12.75
Equipment	$27.55	$48.05	$57.05	$62.05	$78.95
Total	$37.80	$59.55	$68.55	$74.80	$91.70

These costs can be reduced if classes share equipment. The student booklets have to be replaced each year. Any other replacement costs would depend upon breakage or loss of equipment.

CURRENT STATUS AND CONTACTS

The K-4 portion of the program is completed and available for purchase from the project office. Approximately 20,000 students are now using the program. The 5-6 portion of the program will be field tested and evaluated during the 1976-77 school year.

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

Send for Pamphlet No. **M8.**

Additional information may be obtained from:

Metric Project
University of Hawaii
1776 University Avenue
Honolulu, Hawaii 96822

INDIVIDUALIZED COMPUTATIONAL SKILLS PROGRAM

Houghton Mifflin Company
Boston, Massachusetts

WHAT HAS THE PROGRAM ACHIEVED?

In Flint, Michigan where the program was developed, ICSP Computation test data revealed that the actual gains in computational skills of participating students in grades 3-6 exceeded the elapsed time between pre- and posttests. The average gain for students in grades 3-6 over a seven month period of time was 10.2 months.

Third grade students tested in 1968-69 were re-tested in the sixth grade in 1971-72. Normal gain expectancy for these students (one month achievement for one month instruction) would have been 21 months; however, the average gain of 19.8 months by these students was 93% of normal expected gain. These data should be interpreted in light of the fact that ICSP is a supplementary program for underachievers. The data revealed that students who benefited most from the program were those who were one or more years below grade level in arithmetic computation achievement.

HOW DOES THE PROGRAM WORK?

Organization: The program is organized around a Sequential Skills Outline which lists: 123 computational skills ranging from basic skills taught in the primary grades, to operations with whole numbers, fractions, decimals, and percents. These skills are grouped into twelve basic skill areas and arranged according to difficulty.

A computer-Assisted Instruction Version of ICSP exists if a computer is available. This component can be used to maintain records on each class and each student.

Materials and activities: Teaching Models provide the teacher with student oriented explanations and examples of how to perform in relation to each skill. Students utilize Drill and Practice Sheets to master computational skills, and are provided with record sheets on which to chart their own progress. Arithmetic Skills Inventories and Computation Tests are provided to assess student abilities in each skill area and to determine grade equivalence and proficiencies. The teacher also receives charts to be used on a monthly basis to record each student's work assignments and performance, plus a profile chart for the class as a whole.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: Introductory conferences are provided for staff members by representatives of Houghton Mifflin Company.

Cost: No special facilities are needed unless the computer assisted version is implemented which requires a computer terminal. Classrooms using ICSP for the first time should start with the sets indicated below. These sets contain all necessary testing, diagnostic, drill, and record keeping material for initial use.
Prices are as follows:

Primary Set	$49.50
Set A, Grades 3 or 4	$99.96
Set B, Grades 5 or 6	$179.85
Set C, Grades 7-12	$179.85

CURRENT STATUS AND CONTACTS

Program development is complete.

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

Send for Pamphlet No. **M9.**

Additional information may be obtained from:

Houghton Mifflin Company
Boston, Massachusetts
(617) 725-5000

INFINITY FACTORY

Education Development Center
Newton, Massachusetts

WHAT HAS THE PROGRAM ACHIEVED?

During the trial broadcast season, Spring 1976, an evaluation of eight of the programs in the series was conducted in four U.S. cities. Over 1,000 students and their teachers in 39 third through eighth grade classrooms participated in the ten-week evaluation study. This study included an analysis of the effectiveness of the series as a whole, as well as an analysis of the effectiveness of each of the eight individual programs in the series. Areas assessed included: student attention; student appeal; student knowledge of math content; student comprehension of the dramatic story line; student attitudes toward the social and cultural goals of the series; student and teacher attitudes toward T.V., math, and T.V. programs about mathematics; and the number and type of show-related classroom activities.

Posttest analyses revealed that students showed significant gains in their knowledge of math content. The student and teacher viewers indicated that the shows held their attention and were especially appealing to Black and Latino students, the intended target audience.

HOW DOES THE PROGRAM WORK?

Organization: "Infinity Factory" is a series of half-hour television programs using a magazine format and targeted for children aged 8 to 11, especially Blacks and Latinos. Each show is made up of short segments which address the same mathematical and cultural goals in different ways. Recurring segments include "Scoops' Place" and "City Flats," two dramatic mini-series that emphasize Black and Latino perspectives, and a "Brownstone" studio set featuring a young resident cast drawn from several cultures. Other components include animated cartoons, math-in-the-street interviews, filmed documentaries and some basic arithmetic facts.

The program is primarily for home viewers, but is also suitable for use in school programs.

Materials and activities: Program guides are sent to teachers and include some materials that may be reproduced or posted in classrooms. After viewing the program, there are opportunities for class discussion, whole class activities, and small group activities. By using the materials in the guides, the teacher has many programming options.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: No special training is needed.

Cost: Costs depend upon the availability of television receivers in a school.

CURRENT STATUS AND CONTACTS

This series of 52 half-hour programs was scheduled for broadcasting over the Public Broadcasting Service for classroom use beginning Fall, 1976.

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

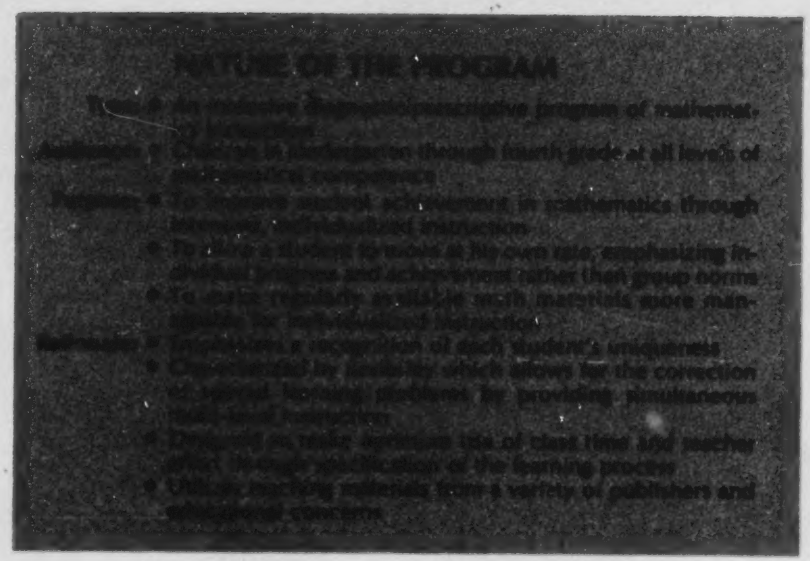
Send for Pamphlet No. **M10.**

Additional Information may be obtained from:

"Infinity Factory"
Education Development Center
55 Chapel Street
Newton, Massachusetts 02160
(617) 969-7100

MULTI-RESOURCE MATHEMATICS MANAGEMENT SYSTEM (MRMMS)

Linden Avenue School
Glen Ridge, New Jersey 07028



WHAT HAS THE PROGRAM ACHIEVED?

The pre-post performance of 48 third and fourth graders, who were evenly divided into experimental and control groups revealed significant differences favoring the experimental group on subtests of the Stanford Achievement Test in Computation, Concepts, and Application. Experimental students also evidenced significantly greater attention to learning tasks as measured by the "p" ratio observational scheme.

HOW DOES THE PROGRAM WORK?

Organization: The program is intensive and individualized. It is designed to diagnose each child's skill level and provide the appropriate prescriptive materials to enable each child to move through a series of 527 instructional objectives at his own pace. It is expected that each student will spend between 45-60 minutes daily on the program. One teacher and one aide can manage the learning environment efficiently.

Materials and activities: Housed in an oversized classroom designated as a "Math Center," materials include pre- and posttests, record forms, a catalogue of teaching resources, and the resources themselves. Activities are individually prescribed according to student need, and closely monitored. Resources available to the children include audio-visual aids, kits, workbooks, tapes, and educational games. The program emphasizes the optimum use of materials from a variety of publishers.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: Because of the highly individualized instructional nature of the program, teacher training in, and commitment to, this teaching style is critical to the success of the program. The project site has instituted an initial five day training program for teachers with a two day followup during the school year. A detailed *Teacher Training Manual* is provided as part of the system.

Cost: The cost of installing the program to date has been $5,500, or $36.67 per student. Maintenance costs are minimal: for three years the program has served 450 children for four hours weekly at a cost of $10.20 per student.

CURRENT STATUS AND CONTACTS

The *Multi-Resource Mathematics Management System* was developed over a two and one half year period at the Linden Avenue School, through ESEA Title III funds. The program was validated in 1976 as an exemplary program.

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

Send for Pamphlet No. **M11.**

Additional information may be obtained from:

Linden Avenue School
205 Linden Avenue
Glen Ridge, New Jersey 07028
(201) 748-5394

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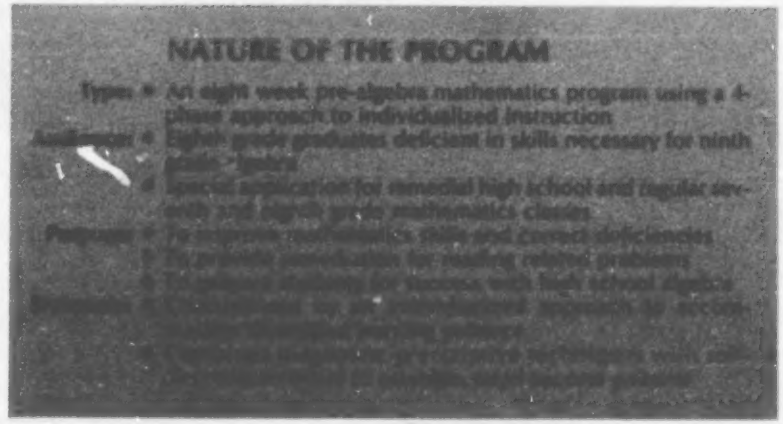
PRE-ALGEBRA DEVELOPMENT CENTER

Chicago, Illinois



WHAT HAS THE PROGRAM ACHIEVED?

Program effectiveness has been assessed both in terms of demonstration of immediate improvement of math performance, and in terms of long-range impact upon student achievement.

An evaluation of program impact during the summers of 1972-1974 revealed that students attained all objectives which related to academic attainment: a comparison of pre- and post-test scores on the *Metropolitan Achievement Test* (MAT) showed performance gains significant at the .01 level. In addition, an average of 83% of students obtained a stanine of 4 or better on the MAT, the minimum level of competence required for entry into Ninth-Grade Algebra.

A followup study of students who had participated in the Pre-Algebra Program between 1968 and 1973 (no data were available for 1970) produced the following data:

—80% of the students qualified for enrollment in Algebra upon completion of the eight-week summer session

—92% of those successful students completed Algebra with a high degree of competence

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—85% of the successful Pre-Algebra students took additional mathematics courses beyond Algebra
—15% of these students took four years of high school mathematics
—Student attendance was significantly greater for Pre-Algebra students than for other math students, suggesting a more positive attitude toward math and school.
—of the 1968 Pre-Algebra students (who graduated in 1972), 76% enrolled in college or vocational school
—Of the 1969 Pre-Algebra students (who graduated in 1973), 90% enrolled in college or vocational school

HOW DOES THE PROGRAM WORK?

Organization: The Pre-Algebra program is organized into four specific phases:
Laboratory—Individual and small group activities involving such activities as the development of concrete models for math concepts
Classroom—Guided group participation in extension and evaluation of concepts
Diagnostic and Remediation—Individual work on skill deficiencies
Reading—Math-related reading instruction by a trained reading teacher
All curriculum materials are based on five unifying mathematics principles which serve as a foundation for the teaching of all other concepts. These are: ratios and proportions; the property of one; place value; additive properties, and subtractive properties. During the 8-week summer session, students spend 55 minutes a day in each of the four phases.

Materials and activities: Pre-Algebra text materials, lab manipulatives, evaluation instruments, and individual diagnosis and remediation materials are provided. Teacher and commercially made instructional materials are also recommended. Student needs are assessed by means of formal and informal testing and diagnostic procedures. Students keep progress records which help them to evaluate their own learning needs. Materials are used in accordance with individual prescription and self-direction.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: Program implementation is dependent upon the training of a core of teachers and/or a program coordinator. A 5-day intensive training program is offered at a Pre-Algebra Development Center during the 8-week summer session. This program provides training in every phase of the Laboratory/Classroom/Diagnosis (LCD) instructional technique, use of lab and curriculum materials, diagnostic-prescriptive methods, and coordination of the elements of the program. The project offers on-site assistance in setting up facilities and designing an appropriate lab. Provisions are also made for training math teachers in the LCD Technique so they can incorporate various aspects of the program into regular seventh and eighth grade or remedial high school math classes.

Cost: Standard mathematics facilities and educational equipment are adequate for implementing this program. In addition to the materials developed by the Pre-Algebra Project, commonly available math materials are used. The Project's cost estimate for the equipment, materials, and supplies needed to initially install the program amounts to approximately $5,400. Since this estimate includes the purchase price of many commonly available materials, first year costs may be lower. After the first year, only consumable items would have to be replaced. The major cost for the 8-week summer program is for teacher salaries, and this will vary according to district payment schedules. For a program serving 80 students, about 10 teachers should be utilized.

CURRENT STATUS AND CONTACTS

The Pre-Algebra Project, developed under a Title III ESEA grant, was validated in 1973 and is currently expanding under extensions of the original grant.

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

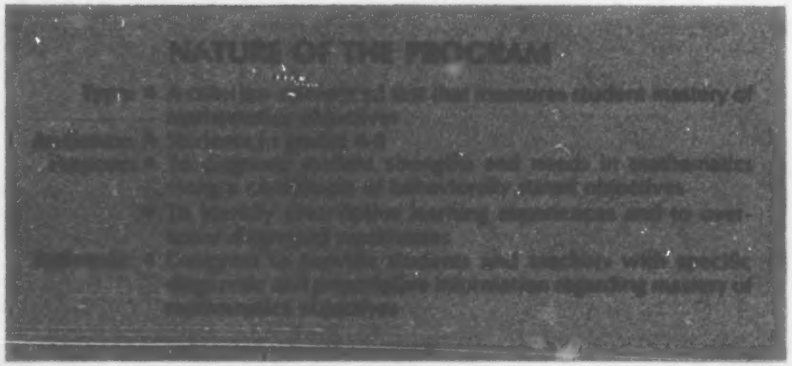
Send for Pamphlet No. **M12.**

Additional information may be obtained from:

Dorothy S. Strong, Project Director
Pre-Algebra Development Centers
400 West 69th Street
Chicago, Illinois 60621
Phone: 312-488-4500

PRESCRIPTIVE MATHEMATICS INVENTORY (PMI)

CTB/MCGRAW HILL
Del Monte Research Park
Monterey, California



WHAT HAS THE PROGRAM ACHIEVED?

The Prescriptive Math Inventory (PMI) is a hierarchically constructed criterion-referenced test consisting of a set of specific objectives which, in their entirety, are intended to measure the student's mastery of a curriculum domain. Each specific objective is measured according to a single item that demands a constructed response. A positive response indicates that the student has mastered the objective. A false positive response, involving guessing, is virtually eliminated by the response format. A negative response indicates that the student has not mastered the objective.

A PMI reliability study was carried out during 1972-73 in two school districts—one in northern, the other in southern California. Phase I of this study involved the construction of a multi-item criterion test for each PMI test item. The criterion tests were then subjected to Kuder-Richardson Formula 20 to deter-

mine the reliability coefficients for internal consistency. 90% of the tests were found to yield reliability measurements of 0.70 or better.

Phase II of the study took advantage of the hierarchical structure of the test. A stepwise multiple regression procedure using interdependent PMI item subscores as predictor variables to the criterion test scores was employed. In every case except one, the multiple correlation coefficient was substantially higher than the point biserial correlation coefficient for its corresponding PMI item, thereby indicating that the PMI single item gives a good indication of mastery or non-mastery of its objective.

HOW DOES THE PROGRAM WORK?

Organization: PMI is a criterion-referenced test based upon a comprehensive inventory of 351 learning objectives keyed to standard textbooks and stated in behavioral terms. PMI is organized into four levels, and the test items sample various levels of difficulty in each of the content areas represented. Student performance is organized and displayed in an easily interpretable diagnostic matrix. Supplementary use of the inventory beyond testing depends upon how teachers integrate test results into their instructional planning.

Materials and activities: PMI materials include the following:

Machine-scorable Answer Grids
Machine-scorable Books
Individual Diagnostic Matrix
Individual Study Guide
Class Diagnostic Matrix
Class Grouping Report
Objectives Mastery Report
Master Reference Guide
Teacher's Guide
Guide to Ancillary Materials
Interim Evaluation Tests

CTB/McGraw-Hill provides a complete scoring service and test results are described in a wide variety of scoring reports. These reports facilitate individualized, small group, and whole class instruction. Instructional prescriptions are available for use with the most widely used mathematics textbook series.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: The teacher should be trained to manage individualized continuous progress mathematics instruction prior to the institution of this program.

The teacher is provided with an Examiner's Manual, a Teacher's Guide, a Guide to Ancillary Materials, a Class Diagnostic Matrix Chart, and a Master Reference Guide.

Teacher aides are not necessary in this program.

Cost: The purchase of the booklets is currently under $20.00 per class, per year. If interim evaluation tests are also used, the cost increases to approximately $50.00 per class, per year.

CURRENT STATUS AND CONTACTS

The program is presently used in seven school districts in New York State. They are Babylon, Bronx, Northport, Port Washington, Setauket, Union Spring, and Vestal. It is complete and useable.

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

Send for Pamphlet No. **M13.**

Additional information may be obtained from:

CTB/McGraw Hill
Del Monte Research Park
Monterey, California 93940
Phone: 408-373-2932

PROJECT CATCH-UP

Newport-Mesa Unified School District
Newport Beach, California

NATURE OF THE PROGRAM

Type: • A program of individualized instruction based upon criterion-referenced objectives and conducted in a laboratory setting

Applicants: • Underachievers in grades K-6

Purpose: • To help students achieve academic success
• To provide a responsive environment for learning

Rationale: • Utilizes an eclectic approach to engage students in learning encounters
• Based upon the assumption that students with special needs can catch up with their peers academically
• Emphasizes personal attention, careful diagnosis, and a wide variety of learning methods and materials

WHAT HAS THE PROGRAM ACHIEVED?

Results of the 1975-76 pre/posttesting using the *California Test of Basic Skills* indicated that students in the program continued to exceed the objective of a 1.5 months' gain in achievement for each month of instruction. Substantial gains in grades 5 and 6 were especially noteworthy, since effective remediation is usually more difficult to achieve in the upper elementary grades.

HOW DOES THE PROGRAM WORK?

Organization: Project Catch-Up is organized around a laboratory environment in which students work alone or in small groups on a variety of tasks which have been matched to clearly defined objectives. Project staff and classroom teachers jointly schedule students' attendance in the lab which may range from 20 to 60 minutes daily. Student progress is measured through pre- and posttesting. Instructional aides are used in the program and parent aides provide additional assistance.

Materials and activities: A wide variety of commercial materials which are related to defined skills, is used in the program. They range from programmed workbooks and criterion-referenced tests to Computor-Tutors and card games. The staff matches materials and activities to the skill needs and interests of the individual student. Skills are taught in a variety of ways to provide for different learning styles.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: The project staff attends a two-week training workshop before the lab opens, as well as monthly inservice training throughout the year. Project Catch-Up has been packaged as a Project Information Package (PIP) for national diffusion, and training materials are included in this package.

Cost: Costs to equip one laboratory with core equipment and materials amount to about $6500. Yearly maintenance costs represent staff salaries and necessary equipment repair or replacement. At the California site, these have averaged $350 per student.

CURRENT STATUS AND CONTACTS

Project Catch-Up has been replicated by districts throughout the United States. Information concerning the program is available in a Project Information Package (PIP).

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

Send for Pamphlet No. **RM4.**

Additional information may be obtained from:
Dr. Frank Thompson
ECOS Training Institute
833 Foxmeadow Road
Yorktown Heights, New York 10598
(914) 245-4009

PROJECT CYCLE

Newton Public Schools
Newton, New Jersey

NATURE OF THE PROGRAM

Type:
- An integrated management system designed to promote thorough and efficient education in a school district

Audience:
- The community, professional staff and students of a school district

Purpose:
- To promote the achievement of thorough and efficient education for a community's children
- To utilize a range of teaching strategies that will enable students to learn effectively
- To significantly increase student achievement levels

Rationale:
- Based on a systematic approach to educational decision-making at every level of the school system which is designed to facilitate individualized instruction

WHAT HAS THE PROGRAM ACHIEVED?

The impact of the Project Cycle model has been evaluated at all three levels of system change: organization, process, and product. Project Cycle was able to achieve its organizational objectives over the course of three years. Two schools were successfully reorganized to use the multi-unit Cycle approach which includes the four components of goal setting, baseline and data collection, strategy selection, and assessment. Cycle also successfully developed and implemented a Research, Planning and Evaluation (RDE) Unit. All of the Cycle process and product components were developed and assessed as a direct result of this unit's activities.

Two of the 22 product items successfully developed and implemented by the Cycle RPE Unit were evaluated in a systematic manner: (1) student achievement in elementary mathematics and Algebra I, and (2) teacher attitudes toward Project Cycle.

Mean achievement scores and mean achievement gain scores on standardized tests yielded the grade equivalent scores used to assess Cycle's impact on students in elementary math in grades 1 through 6. The achievement scores of students in grades 1 through 5 in a project school and a non-project school were

statistically compared for each of three project years. In addition, statistical comparisons were made of the achievement gains of the project and non-project schools for the first project year, and the first two project years combined.

Although participation in Cycle during the first project year generally yielded results favoring the program students over the non-program students, the mean score differences were not significant. However, by the end of the second project year, significant difference in mean arithmetic achievement between the project and non-project schools favored the Cycle students. In addition, the mean gains in achievement for the first two project years combined, favored the project school for grade two students and were significantly greater for the Cycle students in grades four and five.

As sixth grades in both schools participated in Cycle, it was not possible to maintain control groups. Consequently, the Cycle sixth grade was compared with the 1972-73 non-project sixth grade in each school. In both schools there were significant differences favoring the Cycle students. Sixth grade classes in both schools also showed significant improvement in achievement scores during the first two project years.

Differences in scores on the *Cooperative Test in Math*, Algebra I, were statistically analyzed for the three years of project operation in order to assess Cycle's impact on students in ninth grade. Analyses of covariance were used to control for pretest differences in nonverbal IQ. Results indicated that students made significant positive gains during the three years of program operation. In addition, student scores increased significantly from project year one to project year three, and from project year two to project year three.

Teacher opinionnaires distributed at the end of the first three years of Cycle operation, indicated that generally, teachers had favorable and supportive attitudes toward the Project goals, the Management Information System, the Data Collection System, the Program Budget System, and the Cycle objectives.

HOW DOES THE PROGRAM WORK?

Organization: The primary goal of the program is to develop and install the elements necessary for a school district to achieve what has been legislated in New Jersey as a "thorough and efficient" education. This type of education has been formulated to enable students to achieve at their highest level. The Project Cycle process consists of such elements as goal setting, baseline and data collection, strategy selection, and assessment procedures. This process is implemented at the student, program, school and system levels. Ultimately, the program aims at significantly increasing the achievement levels of students enrolled in a program where the Cycle process is complete.

Individual student assessment is a primary component of the program. Teacher program teams construct their own criterion-referenced tests, based upon their assessment objectives. Administered prior to instruction, the results indicate to the teacher the strengths and weaknesses of a particular student.

Materials and activities: Manuals have been written that outline, in step by step terms, the procedures that were followed to attain and continue the development of each component. A filmstrip outlining the process is also provided, as are current program manuals for math, physical education and industrial arts. These include assessment objectives and assessment procedures. There are no special program materials other than a student IBM mark-sense test card which is used for those objectives measured with a multiple-choice paper and pencil test. The program is completely open to supplementary and teacher-made *process*. Members of each program staff decide what they feel the students should know, develop a budget to support those decisions, and develop a way to assess the progress of the students. The Cycle process does not prescribe how an individual teacher should teach.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Training: At least two full days of inservice training are needed for the introduction of the model, design of procedures for the development of a program budget, and the creation of a general staff understanding of performance objectives. In addition, two to three hours a week for team planning is necessary at the school reorganization stage. This same amount of team planning time is essential for continued program development. It is also necessary to have at least two half-day sessions for districtwide program development. Workshops are provided by a team of staff members from the Newton School System. The project manuals and filmstrip also facilitate the staff development process for an adopter district.

Costs: The basic cost of project implementation (assuming that staff already exists in a district for coordinating program elements) includes staff training and computer or computer time purchase or lease. If no staff existed, no appropriate facilities existed, and the adopting district of approximately 2,500 K through 12 students decided to purchase outright the computer and the necessary data processing equipment, the total year I and year II cost would be approximately $116,000 each.

The yearly costs beyond the first two years would be approximately $60,000. This would include the salaries of the director (usually at the assistant superintendent level), a secretary, two computer operators, equipment and material.

CURRENT STATUS AND CONTACTS

The program has been funded as a demonstration site by the New Jersey ESEA Title IV-C program. The Newton Public School System offers to educators the opportunity to visit the site, see the program in operation, and receive training in its replication. Materials required for the program are available at cost.

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

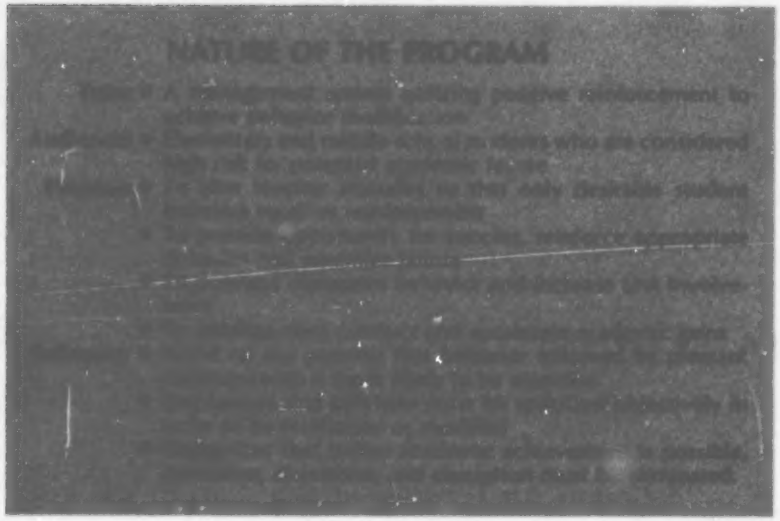
Send for Pamphlet No. **M14.**

Additional information may be obtained from:

Dr. Harry H. Selover
Assistant Superintendent for Research,
Planning and Evaluation
Newton Public Schools
57 Trinity Street
Newton, New Jersey 07860

PROJECT SUCCESS ENVIRONMENT

Atlanta Public Schools
Atlanta, Georgia



WHAT HAS THE PROGRAM ACHIEVED?

The evaluation effort aimed to determine whether the program had been successfully adopted by teachers, and the effects the behavior modification strategies had on student behavior and achievement. Regarding the first question, data collected during observations on a total of 30 control and experimental classes during the project's second year, and on 20 project classes in the third year, indicated the following: project teachers positively reinforced their students about 10 times as often as control teachers and punished about one-third as often as control teachers; these differences between project and control teachers were statistically significant at the .01 level.

Regarding the question of whether student behavior changed, observation data revealed that disruption in project classes was about one-half to one-third that of control classes at both the elementary and middle school levels. In addition, project students increased from about 75 percent task-involved at the beginning of the year to more than 90 percent by mid-October.

Finally, comparisons of pre/posttest scores achieved by the experimental and control students on the *California Achievement Test* indicated that students in project classes gained more in reading at every grade level (with the exception of the third grade in the third project year). Overall, project students nearly doubled the reading gain rate of control students. The difference in gains was statistically significant at the .01 level. Comparable data on gains in arithmetic achievement were reported, based again upon pre/posttest CAT scores.

HOW DOES THE PROGRAM WORK?

Organization: The major goals of Project Success Environment are to reduce disruptive behavior, increase task involvement, and accelerate academic achievement. Accomplishment of these goals requires the alteration of traditional teacher attitudes toward discipline (i.e., negative reaction to undesired behavior) and the provision of positive and effective methods of classroom management. Positive Contingency Management, which is based on principles of operant conditioning, is the heart of the Success Technique. It requires that students and teachers know precisely what is expected of them in terms of appropriate behavior, and that teachers remain consistent in their reaction to student behavior. Clear guidelines, positive statement of rules, and teacher consistency are essential. Individual students are given tasks (behavioral and curricular) which are within their abilities and which make reinforcible success an inevitability. Once class conduct is stabilized, the emphasis is shifted to academic achievement. The Success Technique provides a controlled and positive educational environment in which success is encouraged and expected of each student at his own ability level, and in which potential failures receive appropriate but not threatening attention.

Three components comprise the Success Technique: a positive reinforcement system; a slightly modified curriculum; and, an engineered classroom. Positive Contingency Management relies heavily on a token economy in addition to praise and other forms of social reinforcement.

Materials and Activities: The program does not include project-developed instructional materials. However, the project does recommend testing procedures, including the *Comprehensive Instructional Program Tests*, the *Stanford Diagnostic Reading Tests*, and the *California Achievement Test*. Commercial materials and equipment are also suggested for classroom use.

The classroom arrangement consists of a mastery center and five academically oriented interest stations: a library station, an art station, a communications station with a Language Master and tape recorder, an exploratory station with science materials keyed to the instructional program, and a games and puzzles station equipped with academically related materials. Materials at the stations are rotated among the classrooms weekly.

PROJECT SUCCESS ENVIRONMENT (cont'd)

The students are divided into three groups according to reading ability; group rotation which is organized around structured individualized student activities occurs for both the reading and mathematics content areas.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff Training: The project staff has developed a training program which requires that the adopting school principal be thoroughly trained in Positive Contingency Management and be responsible for the administration of the reinforcement system. The *Project Success Environment: Training Package for Principals* is a detailed guide for training teachers in the theory behind the Success Technique, and for preparing them to implement the technique in their own classrooms. The package is given to an interested principal after the completion of a four-day workshop conducted by the project staff. Using the training package, the principal can train teachers and aides, and monitor program implementation. Currently, state-supported funding for the project has terminated. However, through private contract arrangements with a district, the project has a limited capability to provide training and services to adopting districts.

Cost: The cost of introducing the Success Technique into a school depends upon such factors as whether new curriculum materials must be added and the extent to which tangible rewards are used. The maximum installation cost in a typical elementary school of 400 students is $33.25 per student and the minimum is $3.36. The maximum cost of continuation is $21.25 per student and the minimum is $.75. This maximum second year figure includes costs for employing a teacher aide and spending over $3000 for individualized instruction materials, both of which are recommended but optional.

CURRENT STATUS AND CONTACTS

The project was developed through ESEA Title III funds, and was nationally validated and approved for dissemination by the Joint Dissemination Review Panel of the U.S. Office of Education.

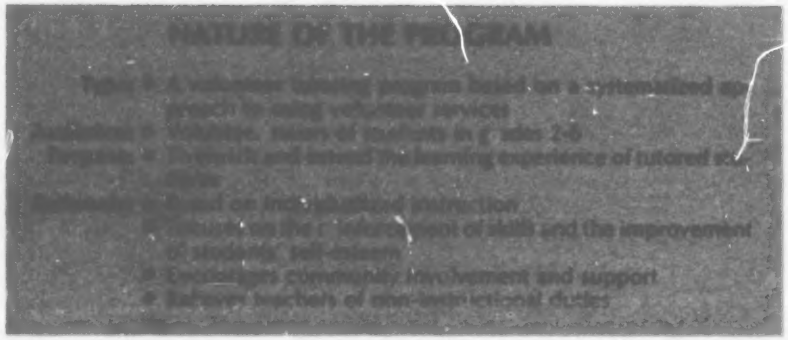
In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

Send for Pamphlet No. **RMB.**

Additional information may be obtained from:
Dr. Will G. Atwood
Title III Director
State Department of Education
State Office Building, Room 255
Atlanta, Georgia 30334
(404) 656-2567

SCHOOL VOLUNTEER DEVELOPMENT PROJECT (DO IT)

Dade County Public Schools
Coral Gables, Florida



WHAT HAS THE PROGRAM ACHIEVED?

Using the *Metropolitan Achievement Test (MAT)* to assess gains of tutored and non-tutored students in grades 2-6, differences in the achievement of the two groups were found to be statistically significant at the .05 level. The control group gained less than a month (0.3) from pre- to posttest on the *MAT* reading subtest, while project students gained more than ten months (10.2). On the *MAT* subtest, the control group's mean score declined slightly from pre to posttest (-0.59), while the project group gained more than eight months (8.08).

HOW DOES THE PROGRAM WORK?

Organization: The program provides a highly systematized approach to the development and delivery of diverse volunteer tutoring services for students. The project-developed materials and procedures guide adopting school districts

through the various phases of program implementation: recruitment, training, placement, and evaluation.

Once trained and matched up with appropriate students, volunteer tutors spend a minimum of two hours per week with each student. Each session lasts from fifteen minutes to one hour, depending on student need.

Materials and activities: The materials developed by the School Volunteer Development Project over the past three years have been packaged and are available in the Starter Kit for the Utilization of Volunteer Services. This multimedia kit includes a guidebook with step-by-step instructions for recruiting, placing and monitoring volunteers, filmstrips and modules with tapes for the training of volunteers, teachers and administrators, and evaluation forms to measure the effectiveness of the overall program, as well as that of the individuals involved.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Training: The program has a tightly structured training program for administrators, teachers, and volunteers, which can be implemented on either an individual or group basis. Administrators are trained to administer the program, while teachers are trained to effectively utilize the services of a volunteer. The volunteer training can be pre-service, inservice, or on-the-job training, depending upon the skills required for the job the volunteer has selected.

Costs: The cost of program adoption is minimal. The start-up cost amounts to $.31 per student, and management and operational costs for the project amount to about $2.00 per student.

Materials are available for the cost of printing and postage.

Consultant travel and living expenses are an additional cost factor.

CURRENT STATUS AND CONTACTS

At the present time, 230 schools are involved in the Miami program ranging from urban, to suburban, to rural. The project was validated and proven effective in the areas of mathematics and reading, and has been approved for national dissemination by the Joint Dissemination Review Panel of the U.S. Office of Education. In addition, the program is being diffused as a Developer/Demonstrator Project in the National Diffusion Network.

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

Send for Pamphlet No. **RM9**.

Additional information may be obtained from:

Ms. Thelma Green
School Volunteer Program of Miami
Dade County Public Schools
1410 N.E. Second Avenue
Miami, Florida 33132

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SESAME STREET

Children's Television Workshop
New York, New York

NATURE OF THE PROGRAM

Type:
- A televised, preschool educational experience, designed to teach readiness concepts

Audience:
- Children aged three, four, and five years old

Purpose:
- To use the television medium to bring the advantages of preschool training into the homes of all children

Rationale:
- Developed to address the fact that most of the 12 million children between the ages of three and five in the United States do not attend any form of preschool program
- Based on the premise that almost every household in the United States has a television set which preschool children may watch

WHAT HAS THE PROGRAM ACHIEVED?

Extensive evaluation of Sesame Street's first year, conducted by Educational Testing Service (ETS), showed that diverse groups of children in the evaluation—inner-city, suburban and rural—all showed significant gains on the objectives measured, directly correlated to how often they viewed the program (i.e., those who watched the most gained the most). These objectives included simple facts and skills concerning letters, numbers, geometric forms, sorting and classification. Within the age categories, three-year-olds learned the most and five-year-olds the least.

Economically disadvantaged children in the highest viewing categories, although they showed considerably lower attainment on the pretests, exceeded middle class children in the low viewing category on the posttests. The evalua-

tion study of the second year's programs replicated, in general, the positive findings of the first year. It was found, however, that the introduction of more complex tasks reduced the impact of the program in those tasks for children who had not viewed the previous year. Children who had viewed the first year's programming, however, did benefit from the more complex materials. These students were also evaluated by their teachers as ranking high on seven variables, including attitudes toward school and race of others.

HOW DOES THE PROGRAM WORK?

Organization: Sesame Street is broadcast twice daily over the Public Broadcasting Service (PBS) and its local affiliates. Each program segment is one hour long. The shows combine the "live" action of the actors and Muppets with short animated film clips to provide a highly varied and stimulating format. The program has developed cognitive and affective goals relating to the following areas:

THE CHILD AND HIS WORLD:	*Self:* Body Parts and Functions; The Child and His Powers; Reasoning and Problem Solving; Emotions
	Social Units: Career Awareness; Social Groups and Institutions
	Social Interactions
	The Man-Made Environment
	The Natural Environment
	Quality of the Environment
SYMBOLIC REPRESENTATION:	*Pre-Reading Goals:* Letters; Letter Sounds; Rhyming; Verbal Blending; Words; Vocabulary Development; Recitation of the Alphabet
	Numbers Goals: Numbers; Numerical Operations; Geometric Forms
COGNITIVE ORGANIZATION:	*Perceptual Discrimination and Orientation*
	Relational Concepts
	Classification

In addition, the program addresses the special educational needs of bilingual/bicultural children, deaf children, and the mentally retarded.

Materials and activities: The one hour programs are broadcast twice daily over the Public Broadcasting Service (PBS) and its member stations. Teachers and parents who wish to augment the children's viewing with activities can purchase *Sesame Street Script Highlights* and the Sesame Street Activities Manual. An annual Statement of Program Goals is available free of charge.

For classroom use, the Addison-Wesley Publishing Company markets the Sesame Street Prereading Kit developed by Children's Television Workshop (CTW), and the National Textbook Company produces *Trabajemos con Calle Sesamo!* for Spanish-speaking beginning readers.

The Milton Bradley Company has also produced a variety of games including a bulletin board game, Sesame Street Number Concepts 1-10.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: No specific training is required for teachers whose students watch Sesame Street. However, the Activities Manual provides helpful suggestions for classroom activities which are tied in with the television curriculum. In addition, the Community Education Services division of CTW will send personnel to schools and communities to give orientation workshops for parents and teachers. For this service there is no charge. Also, schools may rent a utilization film for training purposes at a cost of $25.

Cost: The *Sesame Street Script Highlights* are available on a subscription basis for $5.00 a season, and the Activities Manual costs $1.00. Prices of commercial materials may be obtained from the publishers.

CURRENT STATUS AND CONTACTS

The program is presently in its eighth season.

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

Send for Pamphlet No. **RM3.**

Further information on community/staff training may be obtained from:

Evelyn Davis, Vice President
Community Education Services
Children's Television Workshop
One Lincoln Plaza
New York, New York 10023

To obtain the Statement of Program Goals, Program Highlights, or Activities Manual, contact:

Dana Zoran
Assistant to the Vice President for Production
Children's Television Workshop
One Lincoln Plaza
New York, New York 10023

STRATEGIES IN EARLY CHILDHOOD EDUCATION (SECE)

Waupun, Wisconsin

NATURE OF THE PROGRAM

Type:
- An individualized developmental program for early school children designed to build essential reading, language, and math skills

Audience:
- All students in grades K-2

Purpose:
- To provide continuous growth instruction in order to bridge the gap between kindergarten and the elementary school grades
- To insure that students have developed the basic visual, auditory, motor, and language skills necessary for successful learning
- To make the learning process more individualized, creative, and independent

Rationale:
- Combines new instructional techniques with a Learning Center approach
- Emphasizes the developmental sequence of basic skills in reading, math, and language
- Allows each child to progress at his own developmental learning rate

WHAT HAS THE PROGRAM ACHIEVED?

In three years of program implementation (1971-72, 1972-73, 1973-74), several evaluation studies, using experimental/control pretest/posttest designs, have indicated that the SECE program is having a significant impact upon student achievement, and that impact is greater with longer program implementation. This impact has been noted particularly in the mathematics area, where the experimental group significantly outperformed the control groups on the mathematics subtest of the *Metropolitan Achievement Test.*

HOW DOES THE PROGRAM WORK?

Organization: The SECE project believes that each child must be functioning at an adequate level in the basic skills areas before terminal objectives in reading, math, and language can be achieved. The SECE program is organized into two phases.

1) Assessment Phase: All entering kindergarten students are diagnostically screened in the areas of auditory and visual perception, and motor and language development. Developmental levels are determined for each child and a student profile is compiled. Part-time teacher aides and parent volunteers often assist during this evaluation process.
2) Educational Programming Phase: Subsequent to individual assessment, appropriate prescriptive programming is selected to provide growth at the child's developmental rate in the four skills areas.

When the prescriptive programs are initially introduced, instruction in the classroom is informal. The major emphasis is upon helping children to work independently and to solve their own problems. As the classroom becomes more structured for independent learning, separate Learning Centers are organized in the four basic skills areas: Motor Skills, Visual Perception Skills, Language Skills, and Auditory Perception Skills. Each component of a student's prescriptive program begins with approximately 15-20 minutes of instruction per day and may be extended up to an hour per day over the course of the school year. Teachers direct students to the various Learning Centers or to small group or individual instruction activities. They assist students in selecting materials which fit their prescriptive program objectives.

Materials and activities: Project-developed materials for diagnostic assessment, prescriptive planning, and student and class progress records are available from the SECE project. A SECE Project Overview Booklet and Implementation Manual are provided at no cost to the potential adopter/adapters. As the SECE emphasizes a new approach to the traditional materials and equipment usually available in a kindergarten classroom, no special equipment or additional materials are required. If other materials are available, they can certainly be used to help promote program activities; however, they are not essential.

The comprehensive evaluation process utilizes the project-developed criterion-referenced Screening Instrument. After assessment is complete, teachers use the Prescription Guide to plan individualized instructional programming specific to each student's developmental level and rate of learning. The project-designed Pupil and Class Record System is utilized to track student progress in the attainment of the developmentally sequenced performance objectives.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: The SECE program is funded as a Developer/Demonstrator Project in the National Diffusion Network. Thus, trainers, consultants, and instructional materials for use in preservice and inservice training are available for adopter sites. Ten demonstrator classrooms are available for visitation, and an administrator and a teacher from each prospective adopter site are required to visit one of these classrooms prior to program implementation. Between 6 and 20 hours of inservice training are provided by the demonstrator project staff prior to project adoption or adaptation. During the first year of project implementation, inservice training consists of one two-hour session per month. Inservice training after the first project year can be tailored to the needs of individual adopter-adapter sites.

Cost: Initial installation costs for the SECE project are minimal, ranging from $75.00 to $100.00 per classroom. This cost includes project and instructional materials, plus release time for teachers involved in inservice training. SECE maintenance costs are low and in many cases can be absorbed into the regular classroom budget.

CURRENT STATUS AND CONTACTS

In addition to receiving the National Pacesetter's Award, SECE has been validated by the U.S. Office of Education and chosen as a Developer/Demonstrator Project in the National Diffusion Network. To date, SECE has been adopted in over 250 school districts in 33 states.

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.

Send for Pamphlet No. **RM2.**

Additional information may be obtained from:
Mr. Robert Schramm
Title III Project Director
Cooperative Educational Service Agency # 13
908 West Main Street
Waupun, Wisconsin 53963
(414) 324-4461

TEAMS-GAMES-TOURNAMENTS

Baltimore, Maryland

WHAT HAS THE PROGRAM ACCOMPLISHED?

Carefully controlled studies utilizing experimental-control group designs indicated that TGT had a significant positive effect on student achievement and student attitudes toward themselves and toward their classmates. In addition, the program helped reduce race and sex barriers inhibiting student interaction.

HOW DOES THE PROGRAM WORK?

Organization: TGT has three components: teams, games, and tournaments. The class is divided into four- or five-member teams, each having members from all achievement levels. Skill game exercises are played during tournaments. During the games, students compete individually as representatives of their team against two or three other students of equal ability. Points are awarded on the basis of performance at each table. Games focus on subjects being taught at the time. The curriculum units are designed for six to eight weeks' use in each class period.

Since TGT is essentially a classroom management technique, it is used to supplement the instructional approach already used by the teacher.

Materials and activities: Materials for TGT are designed for the following curriculum areas: (1) Language Arts—grades 3-6; (2) Reading Vocabulary Analogies—grades 3-6; (3) Reading Vocabulary—grades 3-6; (4) Language Arts—grades 7-9; and, (5) Mathematics—grades 3-5. Each unit contains a behavioral objective explaining how games can be applied to the subject matter under study; game packets consisting of worksheets and answer sheets; and, a Teacher's Manual outlining lessons and procedures.

WHAT ARE THE IMPLEMENTATION REQUIREMENTS?

Staff training: Inservice training is suggested to help teachers implement the program. Training can occur at the project site or at the adopter site. The potential adopter must pay for training costs. Awareness materials and Teacher's Manuals are available for training.

Cost: The costs for the curriculum units are as follows:

1. Language Arts Kit—grades 3-6	$110.00
2. Analogies Kit—grades 3-6	$51.00
3. Vocabulary Kit—grades 3-6	$75.00
4. Language Arts Kit—grades 7-9	$127.50
5. Mathematics Kit—grades 3-5	$80.00
6. Sample packet	$6.95

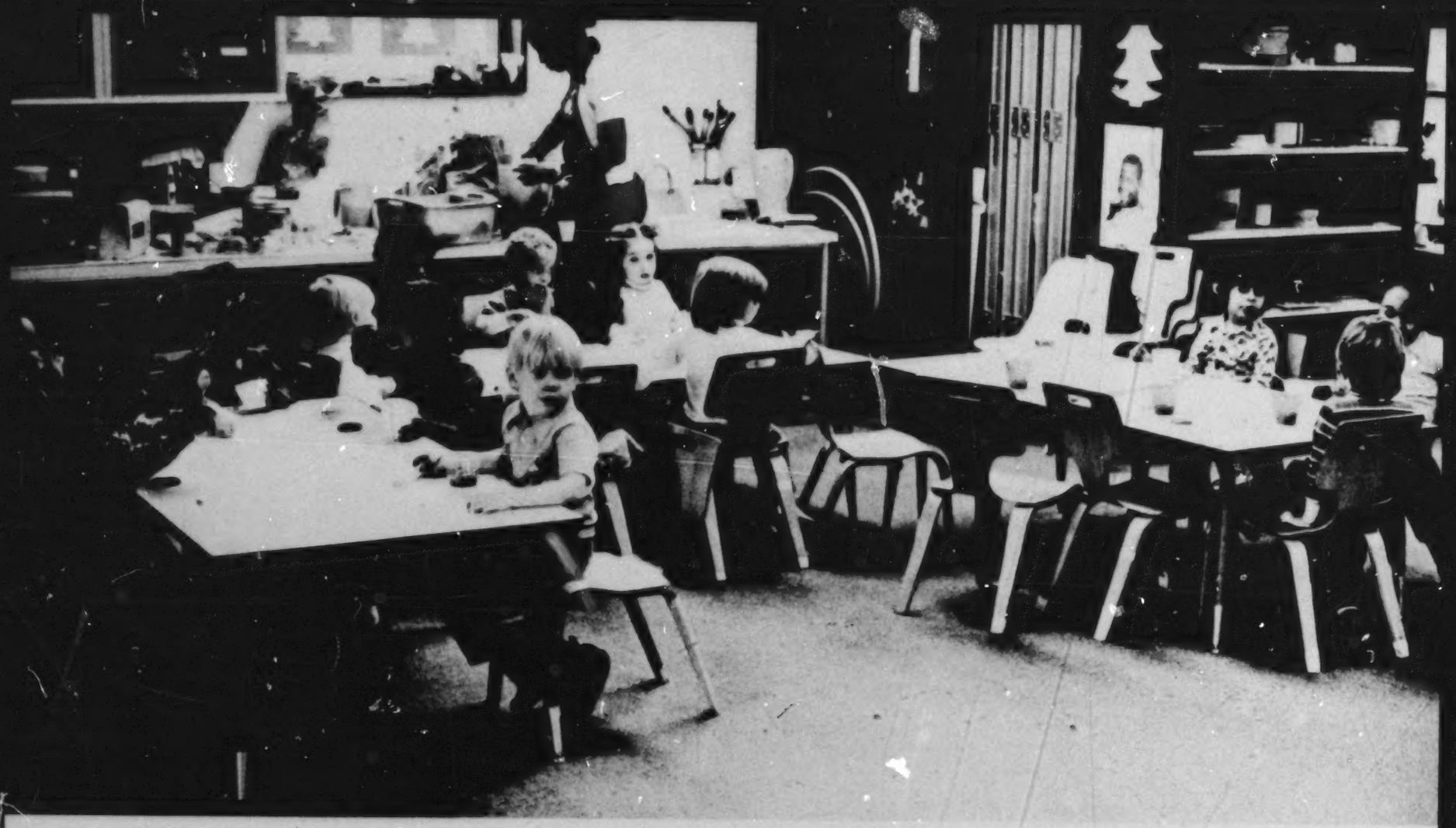
Teachers may utilize these already-developed units or construct their own materials by following the Teacher's Manual.

CURRENT STATUS AND CONTACTS

The TGT instructional technique was developed by the Center for Social Organization of Schools at Johns Hopkins University with funds provided by the National Institute of Education. Since its initial field test in 1973, TGT has found acceptance in over 300 schools in 20 different states. It has been approved for dissemination by the Joint Dissemination Review Panel of the U.S. Office of Education. Current distribution is through:

Argus Communications, Inc.
7440 Natchez Avenue
Niles, Illinois 60648

In New Jersey, a detailed description of this program may be obtained at no cost from the Educational Improvement Center in your region.



Send for Pamphlet No. RM7.

Additional information may be obtained from:

John H. Hollifield
Center for Social Organization of Schools
3565 N. Charles Street
Baltimore, Maryland 21218
(301) 366-3582

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